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THE SANITARIAN,

A MONTHLY MAGAZINE

DEVOTED TO THE

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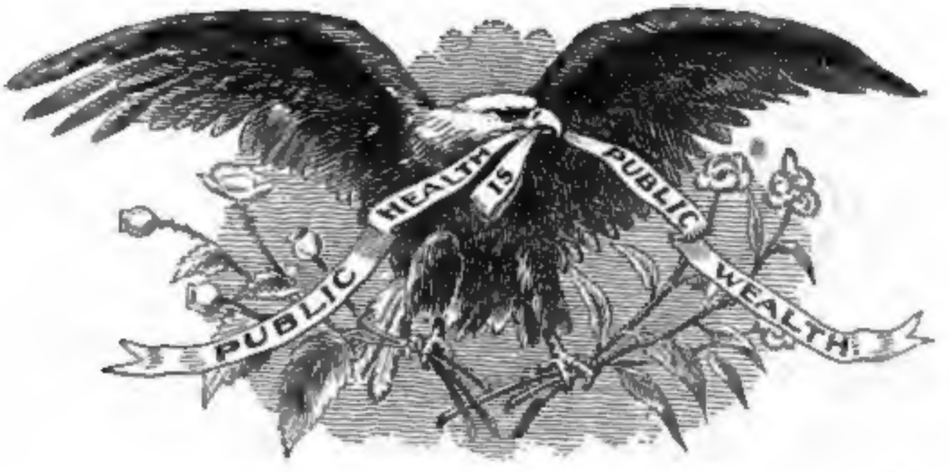

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THERMICS AND THERMO-DYNAMICS OF THE BODY.

BY F. J. B. CORDEIRO, M. D., P. A. SURGEON, U. S. NAVY.

The animal kingdom, in regard to heat, can be divided broadly into two classes—cold-blooded animals and warm-blooded animals. The former conform to the temperature of their surroundings, their vital-chemical reactions taking place with nearly equal facility through a wide range of temperatures. The latter possess a certain definite temperature which they maintain at all times and which may be considered a life function of the species. The difference is entirely one of equlibrium.

All bodies, whether living or dead, must lose or gain heat from the surrounding medium according as their temperatures are higher or lower than that of the medium. In cold-blooded animals this loss of heat is greater than the production, and consequently an equilibrium is not reached until the temperature of the body has nearly coincided with that of its envelope. In warm-blooded animals, on the other hand, since life can exist only within certain narrow limits of temperature, the expenditure and gain of heat must at all times be nicely balanced. Under different conditions it will be seen that the members of such an equation may vary widely, though the equality must always be maintained. The body, then, can be considered a thermostat set to a certain vital temperature.

In studying the movement of heat in a body it is essential to know the specific heat, the penetrability and permeability to heat, of its various parts. Such constants have unfortunately (so far as the writer knows), not been determined for living bodies or for most animal tissues. The total quantity of heat in an idividual would be the sum of the specific heats of its parts multiplied by their masses, into the absolute temperature, which we may consider as 310. The average specific heat of the body might be de-

termined by observing the quantity of heat given out by a dead body in cooling between two fixed temperatures.*

The writer, for his own satisfaction, has made certain observations regarding the thermal constants of animal tissues, but since proper facilities were lacking, they can be considered scarcely more than surmises. In dealing with the problems shortly to be taken up it will be necessary to have some idea in regard to these constants, and the following determinations will serve to fix our ideas. According to certain measurements the specific heat of the blood is somewhat less than that of water, though considerable. Its conductivity may be considered as sensibly equal to that of water. This is as we should expect, since it is composed so largely of water (90 per cent.), and the direct consequence is that, owing to its unceasing circulation the body has a very high permeability (interior conductivity). Whatever heat or cold is received externally or internally is quickly diffused throughout the body and the internal equilibrium is nearly maintained at all times. Not that the temperature of the body is everywhere exactly equal, for such is not the case. The exterior is hotter or colder to a slight extent than the interior, according as the surrounding medium is above or below the vital temperature. Certain parts also, during activity, may be warmer (muscles, glands), and as we shall see later, cooler (lungs), than the neighboring parts, but in general the average temperature is preserved nearly uniform.

We see then that the blood, owing to its high specific heat, conductivity and rapid circulation, is eminently fitted for receiving large quantities of heat (or cold), and distributing it. It thus performs the function of maintaining the internal equilibrium.

According to certain rough determinations the specific heat of the proteids is relatively small, that of muscle being perhaps .08 of water, while that of the bones is less. Of the solid tissues fat stands alone as possessing a very high specific heat, perhaps equal to that of blood, while its conductivity is small. We may thus make an estimate of the thermal capacity of the body as possibly one-third that of water, though in the absence of exact determinations this can be considered as scarcely more than a guess. As fat is mainly situated directly under the skin, it would seem, from the foregoing properties of storing large quantities of heat and parting with it slowly, to be eminently adapted to keeping the sur-

*On the plausible supposition that there is no marked difference between the specific heats of living and dead tissues.

face warm and preventing rapid losses at the exterior. However, rapid losses may take place at the suface under the following circumstances. The skin, which in itself may be supposed to have a very small penetrability, is extremely vascular, and when a large volume of blood is flowing, we may say, in contact with the surface, it may give out or absorb a considerable amount of heat according as this surface is hotter or colder than the surrounding medium. The coefficient of penetrability of the surface may therefore vary from a very small to a very large quantity. It has been observed* that, on exposure to a low temperature, the naked body loses heat from the surface at first rapidly, but that soon the peripheral circulation ceases almost entirely; the skin becomes blanched and, paradoxical as it may seem, the bodily temperature rises above the normal. In this case it is plausible to suppose that the considerable reduction of the expenditure of heat caused by the cessation of the surface circulation causes a temporary storing up of heat. It will be seen subsequently that under the circumstances there is an increased production of heat, also due to compression of air in the lungs, so that the increase of temperature is readily acounted for. The writer has also found that by immersing the body in hot water (41°) there was at first a rapid absorption of heat by the body† (200 calories per second), but that shortly the surface became blanched, showing a cessation of the peripheral circulation, and that under similar conditions of temperature, the amount entering the body from the water (due allowance being made at all times for the loss to the air), became too small to be measured.

The exterior of the body is then, composed of a cushion of fat, itself non-vascular and pierced by a few large blood vessels which ramify extensively directly in contact with the surface.—This cushion of fat has a high specific heat and low conductivity. The skin itself has an extremely low conductivity (no direct measurements have been made), but when filled with a rapidly flowing blood current is capable of emitting and absorbing a considerable amount of heat. Such an apparatus is an ideal one for the admission or exclusion of heat according to circumstances. It is extremely desirable that a series of accurate calorimetrical experiments should be undertaken for the determination of the coefficient of penetrability of the skin under different circumstances. We shall see

* Foster, Text Book of Physiology.

† Shown by the cooling of the water, not by increase of temperature of the body.

later on when we consider experiments on an individual exposed to high temperatures, that this coefficient may become very small.

We shall now attempt to write our physiological equation in the language of mathematics and afterwards to translate it. We have seen that for a warm-blooded animal the sum of the heats expended must equal the sum of the heats produced, for that is the condition of life. We shall endeavor first to tabulate the sources of heat in the body and measure these amounts as far as is possible. In its fullest expression such a problem must be enormously complex, but in general terms we may arrive at an approximate solution.

Ultimately all the heat produced in the body is derived from the potential energy of the food ingested. We can easily measure the total energy of a certain amount of food, but this energy is used by the body in such varying proportions and at such varying rates that little benefit would accrue to our present problem from such an investigation.

An important source of heat in the body is due to the friction of the blood as it circulates in its vessels. All of this resistance, which is overcome by the heart, is transformed directly into heat. We may calculate the amount approximately. If we suppose that 180 ccs. of blood are expelled from the left ventricle at each stroke, under a pressure of one-third of an atmosphere, this would correspond to .6192 kilogramme-metres at each stroke, and at 72 strokes a minute, this would give 44.3124 kilogramme-metres per minute. If we suppose that the right heart does one-quarter the work of the left, or about 10 kilogramme-metres per minute, we have for the total work per minute 54.312 kilogramme-metres, which corresponds to 128 calories per minute.

This is perhaps a rather high estimate for ordinary conditions, but where, as we shall see later on, the heart is forced to pump a much larger quantity of blood in order to maintain the normal temperature, this estimate is probably much exceeded at times. Since this friction takes place largely in the most constricted portions of the circulation, it would be natural to expect that the blood which had been driven through the capillary system of a gland would issue much warmer than it entered and such we find to be the case. Thus the blood of the hepatic vein has been observed to be 40.73 while that in the right heart was 37.7. In the muscles no contraction can take place without an increased flow of blood through them with a simultaneous constriction of the capillaries, which

would naturally give rise to a considerable production of heat—a fact constantly observed.

In the salivary glands during active secretion the saliva may be 1° to 1.5° higher than the blood in the carotid artery. In most text books of physiology this production of heat is explained as due solely to glandular activity (whatever that is), but in view of the preceding discussion we see that a large proportion of it, if not all, must be due to the friction of the blood in the gland capillaries. If a gland during its action performs an anabolism, that is, elaborates a product of a higher potential than the material worked upon, there must be an absorption of heat equal to the potential gained.

On the other hand where a gland secretes katabolically there must be a generation of heat equal to the drop in potential. Considering the muscles as force glands, which in fact they are, there is here undoubtedly katabolism which may be wholly transformed into work, and which would be the case if a muscle were an engine of perfect efficiency. Anabolism also takes place in a muscle, in the heart probably during the return stroke, which would be accompanied by an absorption of heat.

Determinations of the efficiency of muscles, with proper regard for the heat derived from the friction of the blood, have not yet been made. It is probable that a much higher efficiency obtains than is supposed, especially in certain automatic muscles, such as the heart and respiratory muscles which work continually at a constant rhythm.

The heat due to mental activity will not be considered, as it is extremely doubtful if such exists.

To recapitulate, then, we may tabulate as constant and varying sources of heat in the body:

1st. The katabolism of the food.

2d. The friction due to the circulation, which, though varying, may be considered to average about 180 kilogramme-degrees in the 24 hours.

3d. The heat absorbed through the surface when the surrounding medium is of a higher temperature than the body.

4th. The heat due to ingesta when these are of a higher temperature than the body. This includes the inspired air.

5th. Heat due to compression of air in the lungs.

6th. Whenever in external or internal contact with the body, any substance passes from a gaseous to a liquid state (condensation), or from a liquid to solid state (solidification).

It will be noticed that glandular activity is not included in the above list, since the heat generated in a gland is probably either frictional or katabolic.

Next, inquiring into the various means by which heat is lost to the body, we have:

1st. The loss through the surfaces when the external temperature is lower than that of the body.

2d. Whenever, in external or internal contact with the body, any substance passes from a solid to a liquid, or from a liquid to a gaseous state. Thus solution of salt or sugar in any liquid is accompanied by a definite absorption of heat. When food is dissolved by the digestive liquids, heat is absorbed and the resulting temperature is that due to the liquefaction plus, of course, the potential energy lost when katobolism takes place. The evaporation of water, whether on the surface or in the lungs, is of course attended with an absorption of heat which is equal to the latent heat of vaporization at the temperature of the body. The amount of heat which may be lost by evaporation of water on the skin varies within very wide limits. It depends on the amount of perspiration secreted, or the temperature and relative humidity of the atmosphere and the velocity of the currents of air to which the body is exposed. When saturation of the atmosphere exists and the external temperature is less than that of the body, evaporation can still take place at the surface, but when the temperature of the surrounding medium is equal or greater than that of the body, no evaporation can take place, and consequently no heat can be lost to the body by this means.

. 3d. Heat may be lost by the warming of ingesta, and this applies to the inspired air. This is only possible when the ingesta are colder than the body, since as we have already seen in the reverse case heat will be gained. It is stated in most physiologies that heat is lost to the body through the expulsion of the urine and faeces, but a little consideration will show that the temperature cannot be affected by this means, while if the substances from which these products are derived were originally ingested warmer than the body there must be a net gain of heat. Accordingly the urine and faeces have no place in our problem.

4th. Heat may be lost to the body by the expansion of air in the lungs during the process of breathing. Let us consider carefully the changes taking place during the respiratory cycle. For the average individual the capacity of the chest at the beginning of in-

spiration, including bronchial nd nasal passages, is about 3,000 ccs. The tidal air is approximately 500 ccs. This is the amount expired or inspired, and the two quantities are sensibly equal. During each breath there is an interchange of gases between the blood and the air in the lungs, 4 per cent. of the oxygen of the inspired air being transferred to the haemoglobin of the blood, while the partial pressure due to the oxygen is replaced by an equal volume of carbonic dioxide from the blood. Since the loss of pressure from absorption of the oxygen is at each instant made good by a corresponding substitution of carbonic dioxide, we may consider the dynamics of the expansion and compression of the gases in the lungs without regard to these interchanges.

We may liken the action of the chest to the stroke of a piston in a cylinder. Since the orifices by which the air is admitted to the lungs is relatively small to their capacity, it follows that if the expansion takes place faster than the air can rush in we shall have at first a brief period in which the pressure of the air in the lungs sinks to a minimum, when the inrushing air, which increases with the difference of pressure, externally and internally, is at length sufficient to prevent the pressure sinking any lower. This minimum pressure is preserved until the end of the stroke when an equlibrium is again established between the external and internal pressures.

During the return stroke, which is the act of expiration, the pressure is increased in the lungs to a maximum until the rate of outward flow prevents a further rise. This maximum is maintained until the end of the stroke, when by expansion the external and internal pressures are once more brought into equilibrium. Practically, for rapid breathing, we may consider the act of respiration as simply a forward and backward stroke with alternating minimum and maximum pressures, and that no air leaves the cylinder except while the piston is in motion.

What the maximum and minimum pressures in the ultimate air cells are we do not know, but experiments show that in the trachea these pressures are about 70 mms. of mercury above and below the atmospheric, for ordinary breathing. Since the lungs (with exceptions) are emptied quicker than they are filled, there is some reason to suppose that simultaneously with inspiration the bronchioles contract and with expiration relax.* Their structure, the folded

* These may be reversed to obtain peculiar effects of respiration, as we shall see later on.

arrangement of the mucous membrane and the circular muscular fibres surrounding them would seem to support this view.

It is a matter of frequent observation that a warm-blooded animal maintains its proper temperature in a much higher atmosphere for an indefinite time.

It is usually explained that this equilibrium is maintained by the evaporation of the perspiration from the skin with perhaps a certain amount from the lungs. It is true that a large amount of heat is, under ordinary circumstances, so dissipated, and if we suppose the air to be perfectly dry, an unlimited amount of perspiration to be secreted and the body to be exposed to a draught of very high velocity, there is scarcely a limit which can be put to the temperature which the body could not theoretically endure. But if we suppose the atmosphere to be saturated (and of higher temperature), we can have no water evaporated from the skin. But we know that a body, even under these conditions, may maintain its temperature. It is evident that the thermotaxic mechanism can bring about such a result by two means acting conjointly, and only by two means. First the penetrability of the body is diminished, and with it the quantity of heat which enters the body from without. But this is not sufficient. Secondly, there must be an absorption of heat in the body. We shall now see that this absorption is brought about by a peculiar kind of respiration whereby a greater weight of aqueous vapor is expired than is inspired and by the expansion of air in the lungs.

It will be observed that the manner of breathing differs widely under various conditions according as heat is to be absorbed, or economized to the utmost, or possibly to be generated in the lungs. In a Turkish bath, or on a very hot day, the frequency of respiration is much increased, besides having other peculiarities. This can be observed in a shaggy-haired dog on a very hot day, breathing one hundred or more times a minute, the expirations taking place with explosive suddenness. The animal having no surface evaporation is obliged to run his lungs as a cooling machine in order to maintain his temperature. When going into a very cold atmosphere (if naked) the frequency of respirations is much reduced. A deep inspiration (gasp) is caught and the whole air is held compressed in the lungs for a long time before it is explosively expelled and the process repeated. Here, as we shall afterwards see, heat is absorbed to a minimum degree or, when the external

and internal temperatures have not too great a difference, heat may actually be gained by the compression of the air.

Dynamically we may consider the residual air as remaining permanently in the lungs (though this is not actually the case), the tidal air flowing in and out with each stroke. The air in the body is in relation peripherally with the respiratory mucous membrane, and centrally it is in the closest contact with the pulmonary plexus. Both tracts are excellent conductors, but the capillaries must be much the better of the two. This capillary conductivity may be still more increased by an increase of the blood stream through the lungs. It will thus be seen that when the lungs are laboring to absorb heat, for the cold so produced—if we may use this reverse phraseology—to be taken up and distributed at a maximum, a certain increased flow of blood is necessitated, and this the thermotaxic mechanism provides by an increased heart action. We see, therefore, that when the economy is struggling to maintain its temperature, increased respiratory activity always takes place concurrently with increased heart activity. When in this struggle the economy finally succumbs, we have seen that where death is not due directly to the disturbance caused by the increasing temperature, it arises from respiratory or heart failure. These failures are to be considered not alone an exhaustion of nerve centres, but of muscular tissues as well. Perhaps the latter is the larger factor.

In the following discussion I shall let P represent the pressure of the atmosphere, T the temperature of the body and ϑ the temperature of the atmosphere. Let p be the minimum, and p_1 the maximum pressure of the air in the lungs during any respiration.

I shall consider first the aqueous vapor in the lungs at different stages of the respiratory cycle. Let the relative humidity of the atmosphere be r. If we suppose a half litre of this air to be inspired at each breath, which is an average amount, it will contain: $\frac{5}{8} \times \frac{1.293}{1} \times \frac{\quad}{1+\alpha\vartheta} \times \frac{\pounds\vartheta}{76} \times r = \alpha$ grammes of water, where $\pounds\vartheta$ is the partial pressure of saturated aqueous vapor at temperature ϑ and $\alpha = .00367$.

Let us now suppose that by the return stroke the pressure is raised to p_1. If this return stroke be executed slowly, the air in the lungs will nearly maintain a temperature T and be compressed isothermally. A certain amount of water will be condensed, but if the return stroke be executed suddenly it will approach towards a limiting condition where the air is compressed adiabatically and

the tidal air, since conduction is a function of the time, will be expelled before it has time to part with its heat of compression, or with any of its aqueous vapor. It is to be remarked that the air in the lungs is at all times saturated.

We may suppose that the inspired air at the end of inspiration will have acquired the temperature of the blood, although the expired air may not have time to do so before being expelled, for the following reasons: First, as the inspired air swirls in, it is carried by its momentum inwards against the rapidly flowing blood current, so that the major part of the expired air is the original air in the lungs. Secondly, coincidently with the compression of expiration, the expired air begins to leave the body, so that at any subsequent instant only a fraction of it remains inside the body. Thirdly, the time of inspiration is usually longer than that of expiration.

The mass of the expired air, if oringinally at temperature T and compressed adiabatically from pressure p to pressure p_1, will be raised to the temperature $t=(\frac{p_1}{p})^{\gamma_T}$, where $\gamma=\frac{k-1}{k}$ being the ratio of the specific heat of air at constant pressure to that at constant volume. This mass of air must take up sufficient water to saturate itself at its volume, pressure and temperature.

The weight of water necessary to saturate this mass under the conditions is: $\frac{5}{8} \times \frac{18^m}{s} \times \frac{1}{1+\alpha(t-273)} \frac{f_t}{760} \times \frac{P_{11}}{p_y} = b$ grammes, where f, is the partial pressure of saturated aqueous vapor at temperature t. If $b > a$, there must be an evaporation of water at every breath.

We have considered in the above discussion only the aqueous vapor in the tidal air since, the residual air always returning to initial conditions, the sum of the evaporations and condensations must be equal for the complete cycle.

We shall next consider the dynamic changes in the lungs on the supposition that the air is dry. If we suppose the mass of the residual air to be M and that of the tidal air to be m, and that the expansion from p_1 to p, and the compression from p to p_1 is performed so quickly as to be adiabatic, and that at end of inspiration and expiration the temperatures coincide with that of the blood, we may write the quantity of heat extracted by the residual air from the blood during expansion $M\ s_p(T-(\frac{p}{p_1})^{\gamma_T})$ and that restored during compression $M\ s_p((\frac{p_1}{p})^{\gamma_T}-T.)$ These quantities will not be precisely the same, since more work is done in the latter case than in the former.

If we suppose the tidal air to be first raised to the temperature of the body and then expanded isothermally, we have as an expression for the heat abstracted from or added to the blood, according to sign, $M\ s_p\ (T-\theta) + \frac{PV}{J} \log \frac{P}{p}$, where V is the volume of the tidal air at T, P, and J is the mechanical equivalent of heat. Sp. is the specific heat of air at constant pressure. During the reverse stroke the mass m of the tidal air is compressed, let us suppose, adiabatically from p to p_1. Coincidently with the compression, however, it begins to leave the body. If the conduction were such that this mass if retained inside the body would give up all its heat in the time of the return stroke, it can be shown that when at the end of the stroke no tidal air is left in the body, but one-third of this heat can be given to the blood. As the expulsion of this tidal air becomes more sudden, a limiting condition is approached in which none of this heat is given up to the blood.

Under the conditions specified we can, therefore, write the total heat lost or gained (according to sign) by the blood, $M\ s_p\ T\ (1-(\frac{p}{p_1})^{\gamma})-M\ s_p\ T\ ((\frac{p}{p})^{\gamma})-1)+m\ s_p\ (T-\theta)+\frac{PV}{J} \log \frac{P}{p}=Q$ or calling $\frac{p}{p_1}=l$, we have $2\ M\ s_p\ T-M\ s_p\ T\ (l^{\gamma}+l^{-\gamma})+m\ s_p\ (T-\theta)+\frac{PV}{J} \log \frac{P}{p}=Q$. Assuming for a particular case that $\frac{p}{p_1}=\frac{7}{17}$ and $\frac{p}{P}=\frac{7}{70}$ we find that $2\ M\ s_p\ T=441.75$ and $M\ s_p\ T\ (l^{\gamma}+l^{-\gamma})=445.5$, while $\frac{PV}{J} \log \frac{P}{p}$ is approximately equal to 4 calories. If $\theta = T$ we have, therefore, $Q= 445.75-445.5$.

We thus see that from the adiabatic compression and expansion of dry air, but little heat can be absorbed during the cycle.

If the expansions and compressions take place isothermally no heat can be gained or lost from the residual air. For ordinary conditions we have seen that about 4 calories is absorbed by the expansion of the tidal air.

Let us now consider how heat may be lost or gained by peculiarities of breathing. Taking, first, strictly normal conditions, we will suppose that the atmosphere is somewhat below the temperature of the body and below the saturation point. Respiration, under these conditions taking place slowly and gently, the maximum and minimum pressures do not deviate greatly from that of the atmosphere. Expiration takes place so slowly that we may suppose a considerable portion of the heat of compression to be given up to the circulation before the tidal air leaves the body. Practically no heat will be gained or lost from the tidal air. The

aqueous vapor of the tidal air enters the body at the pressure and temperature of the atmosphere, leaving it at the temperature of the body and pressure p_1. A certain amount of water will therefore be evaporated in the lungs. The evaporation of this water and the warming of the tidal air will, therefore, absorb a moderate amount of heat which will play an important role in maintaining the equilibrium of the body.

Let us next consider the body placed (naked) in a very cold atmosphere. There will at first be a very rapid loss of heat at the surface, with the thermotaxic mechanism quickly checks by shutting off the peripheral circulation. But it is important that the moderate absorption of heat, which, we have seen above, takes place during ordinary breathing, should be reduced to a minimum. This can be done by compressing strongly the tidal air in the lungs by means of the chest muscles and holding it so compressed for quite a long period, after which it is suddenly expelled and the process repeated. By holding it compressed it will have time to give up all its heat of compression to the circulation, and besides the aqueous vapor in it will be reduced to a minimum, viz., the amount necessary to saturate its small mass at the temperature of the body and the high pressure p_1.

By such a means of breathing the heat usually absorbed by the lungs is reduced to a minimum and, if the difference of temperature of the body and atmosphere are not too great, there may be even a generation of heat in the lungs.

As a matter of fact, after a plunge into cold water, or between the sheets of a cold bed, precisely such a peculiar kind of respiration is observed as could have no other effect than that mentioned above. The breathing consists of a deep gasp which draws in the greatest amount of air possible and then, all means of exit being closed, it is firmly compressed and held so for a long interval, at the end of which the tidal air is explosively expelled and the process repeated. It is evident that from the exaggerated compression a high initial temperature is acquired and, from the prolonged contact with the pulmonary capallaries ample time is given the air to part with all its heat above the temperature of the blood, and to condense the greatest amount of moisture possible, by means of the high pressure. The tidal air is then, under these conditions, launched out of the body suddenly, no time being given for it to take up any heat either by evaporation or expansion.

Let us suppose now that the body be placed in a saturated atmos-

phere or water of a higher temperature than the body. Here no heat can be lost by evaporation by the skin, on the contrary heat is passing continually into the skin. The gain of heat is everywhere positive except in the lungs, and there heat enough must be absorbed to maintain the equilibrium. How shall the lungs work so as to effect this increased absorption of heat? First a deep inspiration so as to get a large amount of tidal air, but the most important part is the expiration. A sudden compression develops an instantaneous increase of temperature and with it an evaporation of water sufficient to saturate the air at the temperature and pressure. These two factors—temperature and pressure—to be sure, work in opposite directions, but the temperature is much the more important of the two. A large amount of water is momentarily evaporated, and this must be suddenly expelled, otherwise the air will have time to cool down and give back heat, first by condensation, second by conduction.

The writer has observed, under the conditions given, precisely this kind of respiration. Where a maximum effect is necessary, the respirations, each of this peculiar kind, are much increased in frequency. The case of the shaggy-haired dog has already been noted. The action of the heart is coincidently much increased in order to distribute rapidly the cold so gained by the lungs.

Recurring to our expressions for a and b above, we see that there must be a certain critical temperature for every warm-blooded animal beyond which it cannot maintain its existence in a saturated atmosphere.

That is to say, theoretically, at this point it will be able to keep its temperature normal, while for a slight excess there will be a steady accumulation of heat in the body, which will result in death by heat. Such death we know clinically takes place under three chief forms which may be merged into each other. First, death may be due to simple elevation of temperature. We know that the vital-chemical processes of the body can only take place within a very narrow range of temperatures, just as in the laboratory certain reactions require a definite temperature. When this temperature is increased the vital-chemical reactions in all the tissues are disturbed. The normal action of the brain cells is changed —coma results. The muscles also change their composition and their function of transforming the potential energy of various compounds into kinetic energy becomes deranged. Such a form of death takes place if the lungs and heart have been able to hold

out thus long in the unequal contest. When one or the other succumbs to the excessive strain put upon it, we have death by respiratory or heart failure, which are familiar enough forms to practitioners who have seen many cases of sun stroke.

Let us suppose that we have a saturated atmosphere of 80°, and that the ratio $l = \frac{7}{11}$, perhaps an average value. Under these conditions we find that $a = .145$ and $b = .132$ $a > b$. Consequently heat will be generated with every breath and the individual could not long survive. 80° therefore is above the critical temperature for a human being where the tidal air is about half a litre and the ratio l cannot much exceed $\frac{7}{11}$.

If A is the quantity of heat that enters or leaves the surface of the body (according to sign), B is the heat generated by the heart, and C is the heat due to katabolism, all in the time of one respiration, we may write $A + B + C + m s_p (\theta - T) = (b - a) L$, * whereas L_T is the latent heat of water at temperature T. All these quantities except C are capable of direct measurement, and knowing the others, C can be found. When the body is at rest it is probable that this value is very small. For high temperatures also, certain experiments of the writer indicate that A is quite small. We may give then as an approximate value of the critical temperature of the human being 65°, or 70° (about 155° Fahr.).

It would be eminently desirable if observations upon a warm-blooded animal could be carried out from a strictly thermo-dynamical point of view. Such experiments, requiring the conveniences of a laboratory, the writer has not had the opportunity of carrying out.

To Convert Fahrenheit to Centigrade Degrees.—A French publication gives the following simple rule for converting Fahrenheit to Centigrade degrees, which, however, does not apply so well to the reverse calculation: Subtract 32 degrees and divide by 2; then add to this one-tenth of itself, and, if further accuracy is desired, one-hundredth more. For instance, if it is required to find the number of Centigrade degrees corresponding to 72 degrees Fahrenheit, substract 32 and divide by 2, giving 20; adding one-tenth more gives 22, and, for greater accuracy, another one-hundredth gives 22.2.

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* A small term—the heat necessary to raise (b–a) grammes of vapour from T to t —is here neglected.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

Fourteenth Annual Session, held at Washington, May 4 6th., 1897.

ABSTRACT OF PROCEEDINGS.*

First Day—Tuesday, May 4th.

President's Address.—Dr. E. Fletcher Ingals, of Chicago, after reciting briefly the history of the association since its organization in 1884. called attention to the great increase in our knowledge of the climatological possibilities in the United States, and urged the members to extend their studies to the effect of climate on various other diseases in addition to those of the respiratory and circulatory organs. The remainder of the paper was devoted to the antiseptic treatment and the limitation of climatic treatment of pulmonary tuberculosis. He briefly cited several cases illustrative of the benefits to be derived from the various antiseptics and from an antiseptic atmosphere, and urged upon the profession the inutility of sending patients at all advanced in the disease away from home, excepting under the most favorable circumstances. The paper closed with the following conclusions:

"In addition to tonics, supporting and anodyne remedies, various antiseptics appear to possess great value in relieving pulmonary tuberculosis, but in order to get good effects it is imperative that the system be as nearly saturated with them as possible. They should be given at first in small doses, but the amount should be steadily increased until the maximum dose is obtained, care being always taken not to disturb the digestive organs. For example, with the oil of cloves we may begin with five drops given in capsules from three to five times daily, after each meal and in the middle of the forenoon and middle of the afternoon, the medicine always to be followed by a glass of milk. The second day the dose should be six drops; the third, seven; and so on until a dose of twenty-five or thirty drops is given each time.

"Creosote can seldom be given in sufficient quantities to have any material effect, because of the disturbance of the digestive organs which it is liable to cause, and because of its coagulating effect upon all albuminoids. The same may be said of carbolic acid.

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* By courtesy of the Publishers—from *Medical Record's Report.*

"The carbonate of cresote is much more bland, and may be given in doses of from five to sixty drops after each meal with the greatest benefit.

"Guaiacol may be given in much the same way as the oil of cloves, though in somewhat smaller doses, but it is usually less easily borne than the carbonate of creosote or oil of cloves, and often cannot be tolerated in sufficient quantities. The carbonate of guaiacol may be used in much the same way as guaiacol itself, but most patients seem unable to take it in sufficient doses. Oil of cloves and carbonate of creosote are the most satisfactory antiseptics for internal administration.

"Iodine may be used as recommended by Shurley with undoubted benefit, but it causes considerable pain and is open to the objection that it necessitates too constant attendance of the physician. It may also be used advantageously as an inhalant.

"Patients should not be sent from home unless their financial and social position is such as to render the journey and sojourn easy and agreeable.

"In the first stage of the disease, patients should as a rule go to a high altitude, where the atmosphere is as warm as practicable. In the second stage they should be sent to a medium altitude. In the third stage, if sent anywhere, it should be to a low altitude, and in most instances to a dry atmosphere.

"When sojourning in a favorable climate the patient should be out of doors as much as practicable during the pleasant portion of the day, but should avoid excessive heat, excessive cold, and unusual fatigue.

"Patients who have been improving under any course of medication should not discontinue it upon going to a different climate, but however valuable any remedy may appear it should not be continued if it become clear that it is deranging the digestion.

"Of anodynes to check cough, hyoscyamus, camphor, cannabis indica, stramonium, and conium are of most value, because they can generally be taken in sufficient quantities without disturbing the digestion, whereas opiates are usually deleterious in whatever form they may be employed.

"The majority of patients sent from home in the later stages of pulmonary tuberculosis are injured by the journey and their lives correspondingly shortened, though in a small percentage a very great benefit is obtained."

Dr. R. G. Curtin, in discussing the president's address, said that

he was much interested in the study of the climate of the City of Mexico. He was a delegate to the Pan-American congress, and considered it one of the most unhealthy cities in the world. He stated that the city had a very high death rate, and gave as a cause the location of the city in a valley which received the sewage. Dr. Curtin's reason for speaking of this fact was to carry out the idea of Dr. Solly's remarks, that something besides elevation should be considered in the location for cases of tuberculosis.

Dr. J. B. Walker believed that the oil of cloves had not only an influence in modifying the general nutrition, but also that it was beneficial in cell nutrition.

Dr. Solly believed that the oil of cinnamon is perhaps a little better antiseptic, as the oil of cloves is not so well tolerated by the stomach.

Dr. Ingalls, in closing the discussion, said he could not agree with Dr. Solly that the effects of change of location are purely mental; he believed also that the bicarbonate of creosote could be taken in large quantities if started in small doses. He had not used the oil of cloves as an inhalant, and stated that he did not expect to attack the bacillus locally by an inhalation. He was familiar with the views of some that the antiseptics were useful in benefiting the nutrition, and he thought they did benefit the blood by increasing the destructive qualities of the blood for microbes.

Choice of a Summer Residence.—Dr. F. I. Knight, in a paper with this title, compared the New England coast resorts, and said they presented differences of temperature, moisture, wind, and other climatic conditions. He said that to be cool in summer on the New England coast one must be where the south wind blows directly from the sea. As the general direction of the line of the east coast runs mostly northeast, the coast would have the south wind from the water if it were not for the interference of the two capes, Cape Ann and Cape Cod. North of Cape Ann as far as Hampton, N. H., and north of Cape Cod, especially between Cohasset and Boston, the south wind comes overland and is a hot wind; whereas north of Hampton, N. H., and south of Cape Ann toward Boston, on what is called the north shore (*i.e.*, of Massachusetts Bay), he said the south wind comes from the sea; therefore these places are cooler than the former. He spoke also of the island resorts, where the quality of sea air is experienced more constantly and the temperature is more equable, but which differ considerably one from another in average temperature. He stated

that the Isle of Shoals was much cooler than Block Island or Nantucket.

Dr. Bowditch, in discussing Dr. Knight's paper, said that the curiously dry quality of the atmosphere on the Maine coast, in spite of the fact of its being on the sea, was so striking that he thought phthisical patients would do well here, and although he had never dared to recommend it for such patients because he had found that mountainous regions were better, still, if a patient wished to try it, he should not hesitate in telling him to do so.

Dr. Solly, in discussion, said he was very glad to hear Dr. Knight's remarks about these home climates; that in Colorado it was often necessary to send patients back East for the summer; that it was a question very important to know where to send them, and that he had been studying the New England climate in that regard. He wished it were possible to secure meterological reports of these places.

Dr. Alton thought there had been too much generalizing in the matter of climate, and that it would be well to study minutely approximate localities.

Dr. Babcock, in discussing the paper, expressed his belief that the effect of climate in the treatment of tuberculosis is largely due to whether or not the patients are able to spend much time in the open air, and that if patients are to be sent away in the summer they should be sent to climates which are stimulating, and that they must go to localities where they can remain in the open air.

Dr. Taylor stated that the reason why tuberculosis was at one time so prevalent along the Maine coast was on account of the insufficiency of food, its quality, and its preparation, and that since the improvement in these details tuberculosis is far less prevalent.

Dr. Bonney stated that inasmuch as he had lived in Maine for a number of years, he had observed that there was a considerable difference in the character of the soil in portions of Maine from that in New Hampshire or Massachusetts. He said there was much surface moisture after a rain storm, and that it took much longer for the moisture to dry than in Massachusetts. He spoke of the ready disappearance of the fogs, which came on after a delightful day and would entirely disappear in the morning.

Dr. Knight, in closing the discussion, remarked that the coast of New England was hardly to be recommended except in the summer and autumn. He said in regard to the prevalence of such a disease as tuberculosis that it should be borne constantly in mind

that it does not exist until introduced, and that it is rather the propagation and development that are to be favored by climatic conditions.

Climate or Environment as a Factor in the Repair of Neurasthenia and Melancholia.—Dr. J. Madison Taylor, in a paper with this title, expressed his personal convictions, based upon cases in his own practice and elsewhere. The paper was designed to elicit comment as to the experience and conviction of other climatologists. The profession is dependent for statistics on this subject upon contributions from those physicians who reside in countries and situations valuable from a climatic point of view. The author's convictions were: 1. That change of climate is of relative insignificance in the treatment of neurasthenic states, although changes of situation quite frequently are of more or less importance. 2. The most important element of change has to do with environment, including not only change of place, but of persons and things. 3. It is important to outline what constitutes the essential points in this change of environment, so that the average practitioner may keep in mind such imperative conditions and modifications as the varying needs of the individual, his domestic and financial status, make necessary.

The paper made special reference to the undesirability of radical changes inconsistent with the customary life of the patient, and laid stress upon the distinct harm wrought upon a highly sensitive organization thrown out of balance by a prolonged residence on the seacoast or in high mountain regions. It called attention to the hurtfulness of rushing about from place to place in obedience to morbid impulses, the outcome of agitation due to disease.

Diseases of the Nervous System Affected by Climate; Climate Defined.—Dr. Sanger Brown, in a paper read by title, stated that benefits derived from change of climate are due: 1. To incidental influences, such as relief from responsibility, change of scene, an outdoor life, and regular habits. 2. To the influence of the climate in the promotion of the general health. 3. To the direct effect of the climate upon the disease itself as the healing influence upon the lungs properly attributed to inhalation of the atmosphere of certain districts. The author briefly recapitulated: "In debilitated states of the nervous system, attended with such disturbances of function as simple melancholia, neurasthenia, neuralgia, insomnia, neurosis incident to the menopause and hysteria, a high altitude and the seashore are contraindicated, and while generally in

such cases a clear cold climate is most beneficial, a few cases do better in a mild inland climate. After a certain degree of improvement has taken place, this may frequently be advanced by sea or even mountain air."

Second Day—Wednesday, May 5th.

A Brief Consideration of Some Points in the Management of Consumption.—Dr. R. H. Babcock in a paper with this title agreed with Finlayson and others that the consumptive's temperature is not febrile until it reaches 101.3° F., and only then requires treatment. He first advises rest in the open air and regulation of the diet. If this does not reduce the temperature, he advises careful sponging or the use of small doses, one and a half to three grains, of antifebrin, or some other non-depressing antipyretic, an hour before meals, as suggested by Detweiler, for the purpose of promoting the secretion of free hydrochloric acid during digestion, it being absent during fever. Sweating he combats with picrotoxin and camphoric acid. Diarrhoea is due less often than is generally supposed to to intestinal ulceration; he considers it due to intestinal fermentation, and treats it with intestinal antiseptics rather than with opium and astringents. He inquired if laryngeal tuberculosis does not contradict high altitudes, and wished to learn from Colorado members why patients are often retained at that high altitude after having developed laryngeal symptoms. It is his belief that patients having recovered in high altitudes should not return to reside at their former homes in the East, although he has known individuals to do so without apparent harm. He wished to learn if the members did not consider such return unsafe and likely to bring on a fresh outbreak of the disease.

The Clinical Value of the Culture Products of the Bacillus of Tuberculosis.—Dr. Karl von Ruck, of Asheville, N. C., read a paper in which he said that the tubercle bacillus produces substances in the culture which are antagonistic to its life and growth, and that the germs cease to grow and die because of the presence of such peculiar substances. The bodies of the germs contain fats which can be extracted with ether or alcohol, and when the fat is removed they lose their properties of retaining the analine stains. After removing the fats the author has extracted them further and practically reduced them to a small residue, consisting of cellulose. The extractive substances produce immunity in guinea-pigs, and act curatively also. The degree of such action appears to stand

in relation to the amount administered. The purified products of the culture, especially such as Klebs has produced, have given the best clinical results, and several cases are reported illustrative of their actions and limitations. In suitable cases, especially the earlier stages, the percussion dullness disappears in newly involved area, and the respiration becomes again vesicular, with corresponding general improvement. Their use is not attended by any danger or discomfort to the patient. It was not contended that these remedies should be used to the exclusion of all other valuable means. On the contrary, the author stated that in the treatment of phthisis we are necessarily confronted with complex pathological changes, the results of tuberculous disease, all of which it could not be hoped directly to influence by remedies which were directed against the tubercle bacillus itself. Other factors, such as climate, have to be considered in the question of treatment. The author has also produced a serum from goats, after the method of Maragliano. In a comparative experiment both his and Maragliano's serums acted alike in effect and degree, protecting the guinea pigs from the usually fatal dose of toxins. Some of these goats are now being further immunized with the extract of the tubercle bacillus, but neither serum nor extract has been used in the systematic tratment of human tuberculosis as yet, and they are still under experimental investigation.

Digestion versus Drugs.—Dr. Samuel A. Fisk, of Denver, Col., in a paper with this title, gave prominence to the use of "food and fresh air" in the treatment of the two most serious troubles which affect mankind, insanity and pulmonary tuberculosis, and in contrast called attention to the mass of drugs vaunted in medical publications and out of them for the cure of all diseases. He questioned whether we had advanced at all on the simplicity of "food and fresh air." He admitted that the profession was somewhat to blame for this, and cited the case of a patient who was getting by actual count eighteen different remedies in the course of twenty-four hours; also of another patient who was receiving hypodermic injections and other treatment addressed to the bacilli. Both patients had brown and furred tongue, loss of appetite, constipation, scanty and high-colored urine; both were improved by the administration of a little calomel and attention to the details of ingestion, assimilation, egestion, food, and fresh air.

Dr. Fisk remarked that the bacillus had assumed such monstrous proportions in our eyes that it must be hunted and killed at

any cost. He said it had been remarked that more patients had been killed with antipyrin than had died from the grippe, and that he sometimes wondered whether the same thing could not be said of creosote and tuberculosis. His own experience has not been favorable to the use of creosote, and it is his custom to substitute calomel and potash. The speaker said that he had seen patients with consolidation, night-sweats, constant cough, and profuse expectoration, accompanied by loss of strength and flesh, and it might be with hemorrhages, do admirably because they could eat, digest, and sleep, whereas he had seen others similarly affected go down rapidly because they could not eat, or digest what they had eaten, or sleep. He cited two cases representing this difference: one subject could neither eat nor sleep and ran down rapidly; the other had an excellent appetite and made such an improvement that in a month's time he gained five pounds, the pulse had fallen from 122 to 106, and the temperature from 103° to 100.4° F., with cough and expectoration decidedly diminished, his chest drier, and his strength greatly improved. He had been given no creosote or other drug to destroy the bacillus, but his digestion had been fostered. The speaker also called attention to the care which must be taken not to tax too severely the digestive powers. He spoke of such affections as chronic bronchitis, asthma, fibroid conditions, and emphysema, in which the patient was apt to become bilious and in which the digestion had to be carefully watched, and advised a good dose of calomel. In cases of hemorrhage accompanied by constipation and scanty and high-colored urine, he had used catharsis and diuresis with good effect. The point which Dr. Fisk made was that the digestion is the *pièce de résistance* in the treatment of pulmonary disease, to be fostered and protected at all hazards, and not to be sacrificed for any desire to destroy that arch enemy, the bacillus.

Aerotherapeutics and Hydrotherapeutics in the Prevention and Treatment of Pulmonary Tuberculosis.—Dr. S. A. Knoff read a paper with this title, in which he spoke of aerotherapeutics and hydrotherapeutics in the treatment and prevention of pulmonary tuberculosis. Preventive medicine was the medicine of the present, and, while he hoped that preventive inoculation and orrhotherpy would be the ultimate treatment for all acute diseases, he expressed doubts as to the discovery of a serum or toxin that would cure pulmonary tuberculosis when it had already worked its destructive process. Continued research to combat the association

of microbes, manifested by acute excerbation, was recommended, his own work in that dircetion with antistreptococcic serum having been encouraging. In describing the anatomical, physiological, and pathological peculiarities of the individual predisposed to pulmonary tuberculosis, the remedies to overcome the insufficient air supply to the respiratory organs, and the abnormally increased sensibility of the general and especially the cutaneous sytem to the slightest changes of temperature, were pointed out. It was shown that the preventive treatment of consumption should begin with the child in utero and be kept up throughout life. A description of a thorough system of aerotherapeutics and hydrotherapeutics, comprising instructions for breathing exercises, rest cure, graduated walks, application of cold water as a tonic, anti-pyretic, analgesic, etc., as indicated in the various stages of the disease, completed the paper.

The Treatment of Tuberculosis by the Antitubercle Serum.—Dr. Guy Hinsdale, in a paper with this title, described the use of the antitubercle serum, in the preparation of which a donkey was first injected with mallein to exclude the presence of glanders, and then received an injection of one cubic centimetre of tuberculin, which dose was doubled every five or six days until two hundred cubic centimetres were received at a dose. Little reaction followed; the temperature rose only one degree or one and a half degrees, with some slight local oedma. After the maximum dose the animal was allowed to rest three weeks for the elimination of tuberculin. It was then bled and the blood allowed to stand in a refrigerator five or six days, when the serum was collected and one-half per cent. of tricresol added to act as a preservative; it was then kept sealed in a cool place. While Dr. Hindsdale considered it too early to make any complete report of the clinical tests of the agent, he described one case in which he had employed the serum in the hope that others would try it. The patient was a married woman, aged twenty-seven years, who had a cough in February, 1896, and began to lose flesh and strength. His notes taken in March of that year were: Left lung normal; right lung, increased vocal fremitus, but not marked; bronchial breathing posteriorly; slight impairment of the percussion note posteriorly; some râles at the apex. In April she weighed one hundred and twenty pounds and was losing flesh, coughed, and had night sweats; consolidation of upper lobe; bronchial breathing on both sides, especially the right; increased vocal resonance. In May there was amphoric breathing

on the right side; she coughed badly and had fever at night. She was in bed one week and had a hemorrhage. She was then pregnant. She was confined January 1, 1897. The physical signs all pointed to well-established phthisis. The case was chosen as being a test of the efficacy of any treatment. The sputum was examined, with the discovery of a large quantity of tubercle bacilli. An injection of five minims of the serum was made on January 16th, and again at intervals of two or three days until forty minims were injected March 2d. On March 25th her weight was one hundred and twenty-seven pounds. There was some soreness below the left apex in the back. There was no elevation of temperature, and no unpleasant effects of any kind were noted. The injections were made in the left arm near the insertion of the deltoid, after carefully cleansing the part. There had been general improvement in all respects, and bacteriological examinations on March 9th and 15th showed absence of tubercle bacilli. On May 2, 1897, the percussion note was clear all over the chest, front, and back, and the only abnormal sign was a slightly increased vocal resonance over right apex. Dr. Hinsdale stated that the patient was steadily gaining weight and strength, had little expectoration, and that the progress of the case would be reported next year.

Observations upon Pulmonary Tuberculosis in Colorado.—Dr. S. G. Bonney read a paper with this title, giving an analysis of two hundred recorded cases occurring in private practice, during a period of two years. He selected his cases upon a basis of supposed adaptability to the climate, and classified them with reference to the probable prognosis at the time of arrival. In stating the results the classification was made according to the physical signs and general condition. The extent and character of the tuberculous involvement and its method of onset were considered, and also the relation of climate to hemorrhage, functional nervous disturbance, and bronchial irritation. The paper concluded with a discussion of complications, with general observations as to management.

Some Personal Observations Upon the Effects of Changes of Climate Upon Men and Animals.—Dr. Richard Cole Newton, in a paper with this title, remarked that "ability to meet the environment" had been defined as "the condition of leadership," and said without doubt it was also the condition of health. He doubted whether the full comprehensiveness of these terms was fully appreciated, and considered that climate, from a therapeutic standpoint

at least, should be defined to mean a man's environment. He considered the great need at the present moment in the study of climatology to be the study of individual cases, and more ascertained and established facts in relation to the action of climatic changes upon people or animals. From a surgical aspect he considered the virtues of the aseptic climate of the Rocky Mountains and their foothills too well known to require any detailed testimony, wounds always doing well. He had seen a knee-joint opened and a floating cartilage fished out without asceptic precautions or antiseptic treatment, and the man was entrely well in two or three days. He referred to the beneficial action of the climate of New Mexico on consumption and on wounds alike. He cited the instance of a young Indian returning from the Carlisle school, dying of consumption, and thought it would appear that phthisis was not an infrequent result of the higher education among the red men as well as among the palefaces, and that we too often lost sight of the fact that phthisis was especially the disease which cut off those who had given up a roving or outdoor life for a stationary or confined existence, and stated that the moving about, even to less salubrious climates, appeared to prevent the onset of this malady. He said that it had been pointed out that the animals in a travelling menagerie were much healthier than those in a zoological garden, and that reference had been made to the remarkable healthiness of gypsy children. He also referred to the fact that man had been so long a wanderer on the face of the earth, shifting his quarters to hunt for food, escape from or pursue his enemies, and was so stamped with this nomadic tendency, that it showed itself at times in this craving for change of air, and said that now, like the caged animals in the museum, the Indians were beginning to die of tuberculosis. The paper gave the following conclusions:

1. That the change of climate from the Rocky Mountains to the seaboard is more severe and dangerous than the reverse, especially to young children and horses.

2. That a medium or even a high altitude is beneficial rather than otherwise to nervous disease and the diseases of women, as well as to phthisis, and is not unfavorable to rheumatism.

3. That in the climate of Northern Texas and New Mexico nephritis in all forms is exceedingly rare, while aneurism is somewhat common in the latter territory.

4. That wounds do remarkably well in all parts of the Southwest.

5. That the ideally wholesome and satisfactory life is a nomadic one.

6. That change of climate does not bring change of disposition, or, for that matter, of predisposition. Precious and even invaluable as change of climate often is in a number of diseased conditions, it is not always what is most needed.

He suggested contentment with smaller doses of climate, and that they be supplemented with larger doses of hygiene, both moral and physical.

Dangers of Tuberculous Infection and Their Partial Arrest by Climatic Influences.—Dr. C. F. Gardiner, in a paper with this title, said that in reviewing the evidence of partial arrest of tuberculous infection by climatic influence, all data of a general character had to be taken with great caution. The impression, due to the complaint being so rarely seen there, that in the arid or elevated regions of the world consumption was not communicated from the sick to the well was not at all proved from such unreliable and imperfect statistics as had generally been brought forward. He said that the immunity apparently due to a climate might be really due to manner of life, such as isolation and a life day and night in the open air; or to selected lives, such as the early settlers of any country live, who, to cope with its hardships, had of necessity to be the strongest; and that therefore it was only after a country had been settled for a considerable time that reliable data concerning climatic arrest of infection could with accuracy be computed. He said that although it was a well-established law that consumption among all races and in all climates diminished in progressive ratio as we ascended from the sea level, there was no absolute safety or non-phthisical line to be drawn at a certain elevation, and that a few cases did occur at any elevation. He mentioned three cases he had seen of death from acute tuberculosis in Ute Indians who had never been out of Colorado or Utah.

Institution Treatment of Pulmonary Tuberculosis.—Dr. C. P. Ambler, of Asheville, N. C., read a paper with this title, the conclus- of which was that closed institutions for phthisical patients offer the greatest certainty for their cure, inasmuch as better results appear to be a necessary consequence of the superior advantages which well-conducted institutions afford, and that *a priori* consideration of these advantages would lead us to the conclusion which statistics and experience have both demonstrated and confirmed.

At the business meeting of the association which followed the scientific meeting of the second day it was:

"*Resolved*, That the association learns with much regret that the weather bureau has been obliged to discontinue the publication of and work exemplified in its recent periodical, "Climate and Health."

"*Resolved*, That this association would urge upon the secretary of agriculture and the chief of the weather bureau the desirability of resuming the said publication; and that the members of this association urge upon the members of Congress from their States to furnish an appropriation for this purpose."

Dr. J. B. Walker, of Philadelphia; Dr. S. E. Solly, of Colorado; and Dr. W. W. Johnston, of Washington, D. C., were appointed a committee to attend to the matter.

Dr. Hermann Weber, of London, and Dr. Charles Theodore Williams, also of London, were elected honorary members.

Third Day—Thursday, May 6th.

Oil of Turpentine as a Remedial Agent.—Dr. J. B. Walker, of Philadelphia, read a paper on this subject. He dwelt especially on its effects in catarrhal affections and as a haemostatic when the lesion is in the mucuous membrane. In gastric ulcer, whether for its influence on the ulcerative process or as a haemostatic, he said it ranks *par excellence* both for efficiency and acceptability to an irritable stomach. Given in small doses, from two to ten drops in water sweetened with the *olacosaccharum anisi*, each dose prepared as taken, its acrimony is obscured and the most sensitive stomach will retain it. In catarrhs, subacute or chronic, whether in stomach, bowels, bronchial tubes, or urinary tract, as a stimulant-alterative, reaching every mucous membrane of the body, either in its ingestion or elimination, its virtues are invaluable, modifying secretion and influencing cell nutrition directly. In the winter coughs of the aged and infirm, its general stimulant action is an advantage additional to its local effect.

Some of the Vagaries of Croupous Pneumonia as Seen in Central New York.—Dr. Henry L. Elsner, of Syracuse, N. Y., presented a paper based upon the consideration of one hundred and fifty cases of croupous pneumonia, of which careful records had been kept. He considered only the atypical forms of the disease. After giving statistics as to the age and localization of the lesion in the lung, he considered apex pneumonia, which in the majority of cases was not associated with profound cerebral symptoms. In fourteen per cent. of the cases reported the initial chill was absent. This

was usually absent in the asthenic pneumonias. He had seen the presence of large areas of a consolidated lung tissue without marked subjective symptoms, and referred to the difficulty with which central pneumonia was diagnosed during early life when associated with gastric or meningeal symptoms. Abdominal pain as an initiative symptom was considered. The writer concluded that the asthenic cases were more frequent than formerly, and believed that the increased mortality of pneumonia was due to this fact. Asthenic cases without chill gave an unfavorable prognosis. He reported three cases of afebrile pneumonia; believed that there was an antagonism between pneumococci toxins and blood surcharged with urea or effete matter. To determine this question he was at the present time making animal experimentation. Cases without fever were found with lowered vitality and nerve force. Hyperpyrexia was considered, as was also "post-pyrexial delirium." Ambulatory, malignant, traumatic, and aspiration pneumonia each received consideration. He did not believe in the existence of malarial pneumonia. Toxaemia was the most important element to be taken into consideration in prognosis and treatment. Anomalies of crisis and lysis were dwelt upon, as was also the occurrence of leucocytosis. He believed that the presence of leucocytosis in acute febrile disease favored the diagnosis of pneumonia; its absence favored the diagnosis of typhoid or a severe form of lung inflammation. He did not believe that the presence of leucocytosis was a certain prognostic sign. Fully developed physical signs were rarely present before the end of the second day of the disease.

The Treatment of Gout by Natural Mineral Waters.—Dr. C. C. Ransom, of Richfield Springs, N. Y., in a paper with this title, said that Hippocrates considered the disease due to the retention of humors in the system, and advised purging and the application of cooling lotions or cold water. If we substitute the term uric acid for humors, we have the most modern theory and the treatment of to-day. He pointed out that the aim in the treatment of this disease should be to stimulate functional activity, and thereby increase metabolism and the excretion of morbific matters, and to correct vices of living, and showed how a sojourn at a properly selected watering-place met all these requirements. He said there were many things to be considered in the selection of a watering-place for gouty patients, since as a rule such patients were nervous and irritable, and needed a pleasant environment where they could be

occupied and diverted and lead an out-of-door life, while their treatment is made a pleasure rather than a drudgery. To be borne in mind also was the fact that results of treatment may be obtained from the hydrotherapic standpoint alone, irrespective of the mineral ingredients contained in the water used. The analysis of the water was therefore not alone sufficient in the selection of such a place, for, unless the facilities for administering the waters were adequate and the details of the bathing procedure were carefully carried out, the treatment, instead of doing good, might be productive of serious ills. While believing thoroughly in the internal administration of mineral waters, the most valuable mineral waters Dr. Ransom believed to be those used externally in the form of baths.

In considering the treatment of gout by natural mineral waters, he related his personal experience gained from the observation of a great many cases which had come under his care during the past ten years at Richfield Springs, and gave briefly a resume of the methods which he employed in the application of these waters. The form of bath given, and the one which seems to answer best, is the immersion or tub bath, the "dose" of the bath being regulated by its temperature and duration, which will be found to vary with different subjects from 96° to 108° F. for the former, and from five to fifteen minutes for the latter. The object sought in the application of the bath he said is to give such a bath as will produce to the fullest extent the physiological effect without exceeding it, for then depression will be sure to follow and harm may result. He mentioned that in determining the proper dosage much care should be exercised, for different patients vary very much in their reaction to the bath, and that it would also be observed that the same individual would vary at different times. He described the usual bath as being begun at a temperature of 98° F. with a duration of eight minutes, followed by complete rest of an hour in bed. The bath is taken three days in succession, preferably in the forenoon and two and one-half hours after a light breakfast. The effects as to exhilaration or depression are carefully noted after the third bath, and from these symptoms and physical examination is determined whether or not it is wise to increase or diminish the dosage, or to continue it as begun. When the baths are found to be depressing they should be modified by lowering the temperature and shortening the duration. A bath at 96° F. for five minutes, or even less, is usually found to accomplish everything desired. Almost all patients taking a course of baths suffer from a general systematic dis-

5. That the ideally wholesome and satisfactory life is a nomadic one.

6. That change of climate does not bring change of disposition, or, for that matter, of predisposition. Precious and even invaluable as change of climate often is in a number of diseased conditions, it is not always what is most needed.

He suggested contentment with smaller doses of climate, and that they be supplemented with larger doses of hygiene, both moral and physical.

Dangers of Tuberculous Infection and Their Partial Arrest by Climatic Influences.—Dr. C. F. Gardiner, in a paper with this title, said that in reviewing the evidence of partial arrest of tuberculous infection by climatic influence, all data of a general character had to be taken with great caution. The impression, due to the complaint being so rarely seen there, that in the arid or elevated regions of the world consumption was not communicated from the sick to the well was not at all proved from such unreliable and imperfect statistics as had generally been brought forward. He said that the immunity apparently due to a climate might be really due to manner of life, such as isolation and a life day and night in the open air; or to selected lives, such as the early settlers of any country live, who, to cope with its hardships, had of necessity to be the strongest; and that therefore it was only after a country had been settled for a considerable time that reliable data concerning climatic arrest of infection could with accuracy be computed. He said that although it was a well-established law that consumption among all races and in all climates diminished in progressive ratio as we ascended from the sea level, there was no absolute safety or non-phthisical line to be drawn at a certain elevation, and that a few cases did occur at any elevation. He mentioned three cases he had seen of death from acute tuberculosis in Ute Indians who had never been out of Colorado or Utah.

Institution Treatment of Pulmonary Tuberculosis.—Dr. C. P. Ambler, of Asheville, N. C., read a paper with this title, the conclus- of which was that closed institutions for phthisical patients offer the greatest certainty for their cure, inasmuch as better results appear to be a necessary consequence of the superior advantages which well-conducted institutions afford, and that *a priori* consideration of these advantages would lead us to the conclusion which statistics and experience have both demonstrated and confirmed.

At the business meeting of the association which followed the scientific meeting of the second day it was:

"*Resolved*, That the association learns with much regret that the weather bureau has been obliged to discontinue the publication of and work exemplified in its recent periodical, "Climate and Health."

"*Resolved*, That this association would urge upon the secretary of agriculture and the chief of the weather bureau the desirability of resuming the said publication; and that the members of this association urge upon the members of Congress from their States to furnish an appropriation for this purpose."

Dr. J. B. Walker, of Philadelphia; Dr. S. E. Solly, of Colorado; and Dr. W. W. Johnston, of Washington, D. C., were appointed a committee to attend to the matter.

Dr. Hermann Weber, of London, and Dr. Charles Theodore Williams, also of London, were elected honorary members.

Third Day—Thursday, May 6th.

Oil of Turpentine as a Remedial Agent.—Dr. J. B. Walker, of Philadelphia, read a paper on this subject. He dwelt especially on its effects in catarrhal affections and as a haemostatic when the lesion is in the mucuous membrane. In gastric ulcer, whether for its influence on the ulcerative process or as a haemostatic, he said it ranks *par excellence* both for efficiency and acceptability to an irritable stomach. Given in small doses, from two to ten drops in water sweetened with the *olacosaccharum anisi*, each dose prepared as taken, its acrimony is obscured and the most sensitive stomach will retain it. In catarrhs, subacute or chronic, whether in stomach, bowels, bronchial tubes, or urinary tract, as a stimulant-alterative, reaching every mucous membrane of the body, either in its ingestion or elimination, its virtues are invaluable, modifying secretion and influencing cell nutrition directly. In the winter coughs of the aged and infirm, its general stimulant action is an advantage additional to its local effect.

Some of the Vagaries of Croupous Pneumonia as Seen in Central New York.—Dr. Henry L. Elsner, of Syracuse, N. Y., presented a paper based upon the consideration of one hundred and fifty cases of croupous pneumonia, of which careful records had been kept. He considered only the atypical forms of the disease. After giving statistics as to the age and localization of the lesion in the lung, he considered apex pneumonia, which in the majority of cases was not associated with profound cerebral symptoms. In fourteen per cent. of the cases reported the initial chill was absent. This

turbance the first week, which is the condition described as "bath fever," and to the most skeptical Dr. Ransom thought this showed that the medicinal bath is not simply a washing process, but is capable of producing as marked systemic effect as the ingestion of a drug. Regular and systematic exercise was also urged as of great importance. In those cases in which active exercises would entail too much fatigue, passive exercise in the form of massage or Swedish movements is given. Diet also was spoken of as another important element in the treatment.

The Salicylate Treatment of Haemoptysis.—Dr. Thomas J. Mays, of Philadelphia, said it was well known that such drugs as gallic acid, tannin, ergot, geranium, hamamelis, digitalis, turpentine, etc., although supposed sheet anchors, are consummate failures in the treatment of many cases of haemoptysis. This the author thought is due to the fact that they do not fill the gap which exists between what they can do and what we expect them to do. He holds that in many cases the arresting of blood from the lungs does not rest on the therapeutic agents' power to constrict the pulmonary capillaries, but on their influence in removing that toxic condition which weakens the wall of the blood-vessel and makes it permeable to its contents. Such a toxin he believes the rheumatic poison to be, which he thinks is more frequently engaged in bringing about haemoptysis than is usually suspected; at any rate, practical experience demontrates that in many a case of bloods spitting which is uninfluenced by any other internal remedy yields to the salicylates of sodium and cinchonidine very readily. Several typical cases illustrating the utility of these drugs are recorded.

Meteorological Conditions of Sunstroke.—Dr. W. R. Phillips, in a paper with this title, gave a consideration of meteorological conditions predisposing to and exciting the occurrence of sunstroke. The relative importance of high temperature, relative humidity, and wind, and the relation of sunstroke to different climatologic characteristics were discussed; also the dependence of sunstroke upon high temperature or direct insulation, not influenced more by high than low relative humidity. The author stated that the degree of temperature precipitating sunstroke was a function of the particular climate, and not fixed or definite for all locations.

Calomel in Diphtheria.—Dr. Leonardo D. Judd, of Philadelphia, in this paper spoke of his personal experience in the specific treatment of this disease. He selected a few of the illustrative cases to demonstrate the treatment which he considered the nearest to a

specific. He stated that in his experience in the treatment of this disease it had been robbed of its terrors, which conviction was based upon the curative results obtained. While admitting that the treatment of diphtheria by mercury was not new, he said there had been no well-defined application of any one form of this agent which would inspire sufficient confidence to carry it to a successful end. He mentioned Trousseau's dread of its use because of the constitutional effects in "modifying the blood, augmenting its fluidity, and so changing its state that the secretion becomes less plastic," and said that in his opinion it was the constitutional action which was to be sought after as well as the topical. He thought that if the germ theory had been as well understood in Trousseau's day as it is now he would probably have modified his opinion relative to the action of the drug. He also spoke of the experience of the late Dr. Riter, of Pittsburg, and concurred in his opinion that in handling the severest type of diphtheria, the danger was not in giving too much calomel, but rather in too little, and not having the courage to push the drug until the bowel action showed the characteristic green, copious, frothy discharge, resembling "frog spittle," such as may be seen in an old water trough.

Dr. Judd cited two cases in which the treatment had been most satisfactory—one that of a child, the other that of a woman of fifty-five years, whose finger had been scratched by the hand of a neighbor's child dying of malignant diptheria. Believing from the severe symptoms that he had a case of inoculated diphtheria, he put her on iron and chlorate of potassium with gargle. On the next day the advance of the disease had become most rapid and severe, when, with a trained nurse rigidly to carry out instructions, in consultation with Dr. Curtain, he determined upon the calomel treatment. Beginning with a scruple at the first dose, it was continued in ten-grain doses every hour for thirty-five hours; but not until three hundred and sixty-five grains had been given was the characteristic action secured, when the calomel was stopped. During the exhibition of the drug the patient ejected from the nose and mouth, at intervals, large pieces of membrane, although no gargle or spray was used. About every three hours during the treatment a mild solution of potash was given, and calomel was dusted over the initial lesion of the finger. Her recovery was splendid, and she suffered but for a short time from partial paralysis of the muscles of deglutition and impairment of the sense of touch in her hands and

ieet, which symptoms disappeared rapidly under the use of faradization. There was no evidence of ptyalism or other ill-effect.

Dr. Judd also referred to three other cases, the only ones which he had seen result fatally—in two foolishly fond mothers interfered with the directions specified; in the third there was what seemed to be cerebral involvement.

In conclusion, Dr. Judd believed there was no danger of ptyalism; he had never seen a case of diphtheria salivated by calomel or hypercatharsis created. He was not unmindful of the potency of the drug, and recommended its heroic use only with proper discernment, and with good, intelligent, reliable nursing. Sleep, he said, too often meant death in these cases, and the wakefulness necessary for the frequent administration of the medicine would do only good to the patient and reward the nurse, from twenty-four to forty-eight hours generally determining the issue.

A Clinical Study of Tachycardia and Its Relation to Graves' Disease and Uraemia.—Dr. Roland G. Curtin, of Philadelphia, in a paper with this title, cited two cases of tachycardia, and mentioned in connection therewith cases of undeveloped Graves' disease, culled from a large number more prominently illustrative in that they had the symptoms of palpitation and excited heart long before the other prominent symptoms presented themselves, and were diagnosticated erroneously as simple essential tachycardia. He considered the careful study of slowly developed Graves' disease very important, and believed that much valuable time could be saved by an early diagnosis. He gave an interesting table, showing the salient points in the differential diagnosis of the tachycardia of undeveloped Graves' disease and simple irritable heart.

[*To be continued.*]

FOOTED THE BILLS.—Francis W. Bird, the "Sage of Walpole," once went to see Dr. S. G. Howe, and found him with his feet swathed in flannels and extended on a chair. "Howe, what is the matter?" he asked. "I have got the gout," said Howe. "You have got the gout—such a temperance man as you!" "Yes, Bird, my ancestors drank wine, and I have to foot the bills!"—Boston Transcript.

THE IMPROVED TUBERCULIN.

'rof. Koch's description of his improved tuberculin ("Deutsche dicinische Wochenschrift," April 1), is encouraging, but very :rved. He carefully eliminates the word "cure" until a suffi- it time has elapsed without a relapse, and confines himself to aking of "considerable improvement." Moreover, he states t his remedy is not effective unless used in the early stages of sumption.

:oncerning the difficulties encountered by him in seeking a iph which would render the human subject immune, Dr. Koch s that solutions with dead bacilli caused bad abscesses. When filtered the fluid it had no better effect than his first tuberculin. ien, after several years of experiments, he came to the convic- 1 that the bacilli in an unchanged, or, exactly speaking, in an lestroyed state, could not be absorbed, he sought for means to troy them mechanically without destroying their characteristic perties, as was done by dissolving them by a chemical process. e object was to destroy an integument which covered each illus. All the first experiments failed. Only when well-dried tures were taken and worked about for a long time in an agate rtar, without any admixture, one could see that the bacilli de- ased in number, and that finally only a few remained. In order remove these, Dr. Koch diluted the substance thus obtained h distilled water, and worked it about by means of a powerful itrifugal machine which made four thousand revolutions in a iute. The fluid was in about half an hour divided into a whit- , opalescent, but quite transparent, upper layer, which con- ied no more bacilli, with a muddy sediment sticking fast to the :tom.

Dr. Koch called the upper layer "Tuberculino," abbreviated . O.," and the bottom layer "T. R." (Tuberculin remainder), O. is very much like the ordinary tuberculin in its qualities. It s almost the same effects as the tubercle antitoxin, but it causes abscesses. The T. R., however, has a decidedly "immunizing" ect. It certainly also causes some reaction if too large a dose is en, but its effect is quite independent of these reactions. While, using ordinary tuberculin or tubercle antitoxin, or T. O., reac- n must be purposely provoked in order to obtain healing effects.

Dr. Koch in using T. R. endeavors to avoid such reaction. For this purpose he tried, by gradually increasing the doses, which were made to follow each other as quickly as the patient's condition allowed, to make him insusceptible to the effects of a larger dose—that is to say, render him immune against T. R. and against the tubercle bacilli themselves.

The treatment is very simple. Injections are made, as with the tuberculin, on the back with a syringe. The fluid contains in one cubic centimetre eight milligrammes of solid. One five-hundredth of a milligramme is given first. This is such a small dose that only very rarely reaction sets in. When this is the case it must be still more diluted. The injections are made about every second day, and the dose is increased so slowly that increase of the temperature above half a degree is avoided. The rising of the temperature, if caused by the injection, must have completely disappeared before resuming the injections. As a rule, Dr. Koch increases the dose up to twenty milligrammes, and if no reaction is perceptible he ceases to inject, or does so only after longer pauses. He has gained the impression that complete immunity is attained about two or three weeks after the application of large doses.

The preparation has been applied by Dr. Koch in a great number of suitable cases, especially of lupus, and he has achieved without exception an improvement far greater than that gained with tubercle antitoxin. "I say improvement," says Dr. Koch, "though many of the cases may be regarded as cured, in the ordinary sense of the word, but I think it premature to use the word cure before a sufficient time has passed without a relapse." The patients felt well, they steadily increased in weight, and, what was especially striking, their temperature did not show the well-known variations in consumptive patients. The Professor says that he does not venture to regard his lymph as the best possible. He intimates that experiments are being made with a new serum which may prove still more efficacious, but he is convinced that the preparation of the tubercle cultures cannot be brought to greater perfection.

Interesting is Dr. Koch's reference to the great danger of his experiments. The cultures used must be as fresh as possible, and an investigator must not forget that it is the most virulent living tubercle bacilli which he has to deal with, and that they are worked upon in a dried state, so that dust cannot be avoided. "I do not," he says, "think the danger connected with these experiments to be

little, and I must confess that I often had a feeling as if I were dealing with explosives."

As to the curative action of the new tuberculin in guinea pigs, Koch has been able to accomplish a cure in from fifteen days to three weeks in cases of tuberculosis that were not advanced. In the case of man, the initial dose should not exceed 0.002 of a milligramme, and if that amount causes fever it must be reduced. The injections are given every second day, and the dose is slowly but progressively increased to 0.5 or one milligramme. If the new dose causes the temperature to rise as much as a degree F., no more injections should be given until it has fallen. In man, the new tuberculin produces its effects only if the tuberculosis is not of too long standing or complicated with secondary streptococcous infections, on which it has no action. It rarely proves effective with patients whose temperature exceeds 100.4° F.

T. P. C.

NATURE-STUDY FOR PUBLIC SCHOOLS.—Nature-study, or seeing familiar things in a new light, is a valuable factor in education. How many people can explain, so that a child can understand, why water puts out fire, why some young squash plants bring their shells out of the ground on their backs and others do not; or show the difference between a leaf-bud and a fruit-bud; or tell from whence all the house flies come? The world is full of such common things, about which people do not inquire. Yet, such subjects can be made very interesting to children and they can be taken up in the schools, not as an added recitation, but as a rest exercise once or twice each week to relieve the monotony of the school room and later be made the theme for a language exercise. Here are two important faculties that may be brought into exercise—accurate observation and the power of expressing definitely what is seen.

The College of Agriculture of Cornell University, has, under the Nixon or Agricultural Extension bill, undertaken to assist, free of expense, all teachers who wish to introduce this work into their schools. All parents and teachers interested in this work are asked to send their address for more detailed information to

CHIEF CLERK, COLLEGE OF AGRICULTURE,
Ithaca, N. Y.

LIFE INSURANCE AND PUBLIC HEALTH PROBLEMS.

By Frederick L. Hoffman.

Enough has been shown in the mortality records of various cities to emphasize the importance of a pure water supply to prevent typhoid fever. It has been shown that wherever typhoid fever prevails to a considerable extent, there we meet with undisputed facts of sewage pollution of the water supply. Where means have been adopted to check this pollution, or where a new and unpolluted supply has taken the place of one unfit for use, there the mortality from typhoid fever has been materially reduced.

What is probably the most successful and important experiment in this country in the direction of exterminating this most fatal disease is in a New England city.

Lawrence, Mass., a city of about 50,000 inhabitants, takes its water from the Merrimac River, the drainage basin of which includes a large number of towns, of which Lowell, only nine miles above, is the most important. Most of the towns discharge their sewage directly into the river and, as a result, the same is grossly polluted. For a long number of years, typhoid fever has been enormously prevalent in both cities, reaching for Lawrence at times a rate as high as 138 per 100,000 (1889). After years of agitation, similar to the past experience of Newark and the present experience of Jersey City, Chicago and Philadelphia, a radical method of purification by means of extensive filter beds was adopted. The first filter was used in September, 1893, and the effect of this method has been as follows on the death rate of that city:

Mortality from Typhoid Fever in Lawrence, Mass.

	Death.	Per 100,000.		Death.	Per 100,000.
1885	17	42.0	1891	55	122.0
1886	23	58.0	1892	50	111.0
1887	47	118.0	1893	39	87.0
1888	48	120 0	1894	24	50 0
1889	55	138.0	1895	16	31.0
1890	60	133.0			

This remarkable decrease in the typhoid mortality is referred to in the report of the Lawrence Board of Health for 1894 as follows:

"The decrease in the number of cases began as soon as the city was provided with filtered water in September, 1893. In January, 1893, Lowell had thirty-six cases, Lawrence had seventy-two. In January, 1894, Lowell had ninety-nine cases and Lawrence only nine.

"And to this is added the following significant comment: 'That the method of the Water Board of providing the city with pure water has been the means of our escaping a severe epidemic during the winters of 1893-4 and 1894-5 is plainly evident, and the citizens cannot be too grateful for the change.'"

The water of the Merrimac River at Lawrence is so grossly polluted with the sewage of the towns above Lawrence that the number of bacteria in 1895 was 7533 per c. c., but, by means of the extensive filter system, 98.87 per cent. of the bacteria are removed, leaving only 86 bacteria per c. c. at the city hall tap.

As a result, the city is now practically free from this disease, and what has been accomplished in Lawrence can be accomplished in other cities where now human lives are wasted under conditions nothing short of criminal indifference or criminal ignorance. How to accomplish this is simply a question of public education and persistent agitation. Life insurance companies, whose large financial interests are so closely allied to every question of public health, should take a direct interest in this matter, and, through the periodical literature issued by most of the companies, call the attention of their patrons to local unsanitary conditions, urging upon them a personal interest in these matters, warning them against the use of water supplies now known to be grossly contaminated, advising the use of boiled water under all circumstances where even a suspicion of pollution exists.

But finally they should, through their corps of medical examiners, bring about a local agitation through the press and otherwise which, in the end, must result in sanitary reforms such as have been accomplished in other cities.

I cannot do better than conclude with a statement of the probable saving in life which could be brought about if the mortality from typhoid fever could be reduced to a reasonable limit, say twenty per 100,000, which is about the rate now normal for the city of Brooklyn, N. Y.

The mortality for eight cities has been consolidated in the following table in the manner that the aggregate mortality from typhoid fever during the period 1870-94, as given in the first arti-

cle of this series for each city, is compared with the calculated number of deaths on the basis of a normal rate of twenty per 100,000. To this has been added the actual excess of deaths over the calculated deaths and the percentage of excess of the former over the latter:

ESTIMATED LOSS OF LIFE RESULTING FROM LOCAL UNSANITARY CONDITIONS IN AMERICAN CITIES.

MORTALITY FROM TYPHOID FEVER.

	Actual Deaths.	Calculated Deaths.	Excess of Actual or Estimated.	Per Cent. of Excess.
Chicago	12,127	3 499	8,628	246.6
Philadelphia	13.406	4,457	8 949	200 8
Cincinnati	3 733	1,320	2,413	182 8
Providence	1,508	540	948	177 4
Boston	4.333	1,890	2,443	129.3
St. Louis	4 091	1,920	2 171	113.1
New York City	8.376	6 377	1,999	31 4
Seven cities	47 574	20,003	+ 27,571	137.7
Brooklyn	2,983	3,137	— 156	....

Seven of the cities dealt with in this table experienced a rate in excess of the assumed normal rate. Brooklyn alone shows an average rate of less than the assumed normal for this period. The total number of deaths in the seven cities reached almost 50,000, whereas on the basis of the normal rate there should not have been more than 20,000. The actual excess of the mortality was, therefore, 27,571, of which probably one-half were insured with either industrial, ordinary or assessment companies and societies. The actual mortality rate was 137.7 per cent. in excess over the calculated rate, and by just so much as this excess is great or small a city is shown to have experienced a lesser or greater mortality from this disease. It will be observed that the rate for Chicago was 246.6 per cent. in excess of the normal rate, while for New York City the rate was only 31.4 per cent. in excess.

If this calculation had been based on the low average mortality rate now experienced in London or Berlin, a vastly more favorable result would have been shown. On the basis of the Brooklyn rate, however, it is not too much to say that 10,000 lives per annum could be saved in this country from premature death through typhoid fever if the public of the various cities could be aroused to take an intelligent and persistent interest in this matter, and, in the end, force negligent and criminally indifferent municipalities to

substitute modern sanitary methods in place of the antiquated methods of trusting to Providence and—the future.

Life insurance companies, on account of their vast financial interest in all problems of this kind, should resolutely take a stand against public indifference to local unsanitary conditions, and especially in regard to the quality of the water supply of towns, in the same decided and effective manner as fire insurance companies concern themselves in regard to the quantity of the water supply. The financial gain resulting from a more favorable rate of mortality would amply warrant that life companies should take this subject into serious consideration, and the possible expense would be as nothing in comparison with the probable gain.—The Spectator, June 3, 1897.

DISEASE PREVENTION IN NEW JERSEY.

A law authorizing measures "to prevent the introduction of dangerous infectious, epidemic and pestilential diseases into the State of New Jersey, and to improve the present system of maritime quarantine," recently enacted, is as follows:

1. No vessel having on board any person or persons affected by yellow fever, cholera, typhus or ship fever, bubonic plague, smallpox, scarlet fever, diphtheria, measles, relapsing fever, or any other dangerous disease of a contagious, infections or pestilential nature, and no vessel infected by any of these diseases, and no infected baggage, dunnage, rags or hides, shall be brought to any wharf in the State of New Jersey, and no person, persons or property shall be landed in this State from any such vessel without a permit shall have first been issued by the health officer of the port, if there be such officer, and if there be no such officer, then by the local Board of Health having jurisdiction in the locality.

2. The master of every vessel from a foreign or domestic port which shall pass the quarantine station located at City Island, or elsewhere in Long Island Sound, or the quarantine station at Fort Wadsworth, or elsewhere in New York Bay, and which vessel is allowed by written permit, issued by the proper officer at either of the said quarantine stations, to proceed to any port or place in the State of New Jersey, shall, within twenty-four hours after the said permit is received by him, exhibit said permit and deposit the same at the office of the local Board of Health of the said port or

place of destination, and he shall be entitled, subject to the rules and regulations hereinafter provided for, to receive from the said local Board of Health, or health officer of the port, if there be such officer, a permit to land passengers, baggage and cargo.

3. The health officer of the port, if there be such officer, and if there is no such officer then the local Board of Health of very sanitary district in this State, is hereby authorized and empowered to order, whenever in the judgment of said officer or Board the public health requires such action, that any vessel which is within the jurisdiction of said officer or board may be removed to the quarantine grounds or to some other place of safety, and may require all of the persons, baggage, merchandise and articles which have been landed from such vessel to be seized, returned on board thereof or removed to quarantine grounds or to other place of safety; if the master, owner or consignee of such vessel cannot be found, or shall neglect or refuse to obey any such order of removal such health officer or Board of Health may employ such assistance as may be necessary to effect such removal, and all expenses incurred in such removal shall be paid for by the master, owner or consignee of such vessel; such vessel shall not return within the limits of the jurisdiction of said board or officer, nor come to anchor, nor land at any wharf within said limits, without the written permission of the said Board of Health or officer of the port; any person employed to remove any such vessel, persons, merchandise or articles pursuant to this section shall have a lien on such vessel, its tackle, apparel and furniture for his services and expenses in effecting such removal.

4. The masters of vessels arriving at any port or harbor in the State of New Jersey shall pay to the health officer of the port, if there be such officer, and if there be no such officer, then to the local Board of Health, the following fees: For inspection of any vessel from a foreign port, five dollars; for inspection of every vessel from a domestic port south of Cape Henlopen, between May first and November first in each year, steamers, three dollars, other vessels one dollar; for medical inspection of every one hundred, or fraction of one hundred, steerage passengers upon transatlantic steamers, two dollars; for each permit issued for the discharge of cargo or baggage brought as feight, twenty-five cents; for sanitary inspection of every vessel after the discharge of cargo or ballast, ten dollars; for disinfection of every vessel from an infected port, or of such vessel as shall require disinfection by reason of exposure to

infection or contagion, fifty dollars; for vaccination of persons on vessels on board of which smallpox has developed during the voyage, each twenty-five cents; the health officer of the port, if there be such officer, and if there be no such officer, then the local Board of Health having jurisdiction in each port and harbor, shall report in writing to the Board of Health of the State of New Jersey on the first day of October of each year; said report shall state the number of vessels inspected during the preceding year; the number of passengers examined; the number of permits issued; the amount of fees received from each vessel and the total amount of fees received, and said report shall also include answers to all inquiries which may have been addressed by said State board to the said health officer or local Board of Health.

5. The Board of Health of the State of New Jersey is hereby empowered to make and alter rules and regulations to prevent the introduction into this State of infected persons and property, and to prevent the spread of any dangerous infectious disease which may have been so introduced; the expenses incurred and the services rendered by any local or State health officer, or by any of their employees, in the discharge of any duty imposed by said rules and regulations in relation to vessels, merchandise, baggage or persons, shall be paid by the master or owner of the vessel in which such persons, baggage or merchandise shall have arrived, and all such expenses, services and charges shall be a lien on the vessels, merchandise or other property in relation to which they shall have been made, incurred or rendered, and if such master, owner or consignee shall omit to pay the same within three days after the presentation of such account, the local or State Board of Health may proceed to enforce such lien in the manner provided by law; any person or persons who shall violate any of the provisions contained in any rule or regulation made by the said State Board of Health under the authority contained in this section, shall be punished by a fine of two hundred and fifty dollars, or by imprisonment for a period not exceeding six months, or by both fine and imprisonment.

6. Any person or persons who shall obstruct any duly authorized health officer in the enforcement of any of the provisions of this act, or who shall violate any of the provisions of sections one, two, three and four of this act, shall be guilty of a misdemeanor, and shall be punished by a fine not exceeding three thousand dollars, or by imprisonment in the State prison for a period not exceeding one year, or by both fine and imprisonment.

LONDON'S MANY NOISES.

From the Boston Herald.

London is the noisiest city in the world. Yet it has no electric cars buzzing and crashing and ding-donging through the streets! London's excesses in noise do not come from its street traffic. Its smooth wood pavement is the quietest thing yet devised for flooring a city, and rubber tires daily multiply. There are two classes of noisy vehicle, the omnibuses and the milk carts, but it is not the wagon wheel nor the wagon load that make London the noisest city in the world—it's the human voice and the human lung.

Anybody is free to make as much noise in London streets as he likes. He may sing, bawl, cry his wares, tootle on trumpets, and no one can prevent him. To his vocal exercises he may add the shrill clatter of the piano organ, and the doleful drum, and none shall say him nay.

At this moment a German band splits the air about my windows. The fat trumpeters planted themselves before the house ten minutes ago, and their ferocious brass squealings have driven me from the chapter on which I was fondly engaged, and having banished forever the struggling thoughts that were trying to get themselves into some inky shape.

When the strong-lunged fiends have blown out their repertoire they will move ten doors away and begin again. For an hour hence I shall hear them gurgling in the neighborhood, inciting all peaceable persons to shatter a commandment.

If the wretches would play well, some excuse could be found for their persistent energy; but they play vilely. All German street bands do.

This identical group of harmony killers will come four nights out of the seven, and make night hideous.

An insolent ruffian with a fife is another terror in our street. You can hear him for half a mile. He will murder any tune he tries.

There's a varlet who comes at dinner time three nights a week to yell "Sweet Marie" and "The Jewel of Asia." I prophesy sudden death for this man.

It is impossible nowadays for any light sleeper to snatch forty winks in an afternoon. There are some lucky creatures who have such stout nerves that they could sleep through the slaughter of

their parish or through devastation by earthquake; but persons thus blessed become fewer and fewer as civilization becomes more acute. Any metropolitan doctor will tell you that nervous diseases are becoming deplorably common. What are invalids to do when the blatant Teutons come bellowing under their bedrooms? You can go into the street and command the clamorous musicians to move on if there is illness in your house, and you can give the wretches in charge if they don't obey; but suppose they move a hundred yards! Their mighty blasts still roll along the street. They can go around the corner. They perambulate all the adjacent passages, and keep within the law and your hearing at the same time. You are defenceless.

There's a cornet blower who come o' Saturday nights and performs an hour by the clock. He's the vilest knave at the business I ever encountered. He has't missed a Saturday for seven years, and he hasn't changed his tune.

If once a week were all—but it is not! There's not a quiet hour from 9 in the morning till past midnight. The alleged musicians stops their odious performances before midnight. Whether it is law or exhaustion that compels them I have never discovered.

When they have passed, the inebriated coster and the roisterous apprentice go home roaring. They come almost invariably in fours, and howling at the top of their voices. They stand on the street corners and howl unintelligible things. When a low-class Londoner is filled with drink he bursts into song and kicks his womankind. Law can touch him for the latter diversion, but not for the former; and yet the fellow's singing is as brutal as his kicking. His bacchanalian ditties are as clamorous as the "yawp" of Walt Whitman's steam calliope. You need expect no sleep till this multitudinous fool has gone to bed.

There is another terror beloved of a certain kind of cockney, and it is never, by any chance, rampant in the daytime. A young coster, having finished his labor and completed the joyous rite of "jumping on his mother," marches through the streets squeezing the air from a concertina. He is accompanied by a group of admiring friends, never less than six in number. They march heavily, these gallant Britons. You hear their boot heels keeping time to the shrill instrument. Now and then they whistle a chorus. More frequently they yell it. Where they march from, and where they march to, no man knoweth. I know only that their nightly processions torture my ears.

No policeman ever interferes with these revelers of the night. The bluecoat has no authority for repressing the ardent choristers; for the police may not "interfere with the liberty of the subject," and "the liberty of the subject" means that any fellow is permitted to make as much noise as he likes when quiet folk would be sleeping.

The singing beggars are the most odious of London's street nuisances. They are always greasy, shiny, whiny, and out of tune. For the most part they sing hymns, but no pen can tell you how they sing them; no words can convey the utter hypocrisy of their sneaking manners. They are as bad a lot as you could find the world over. They trade chiefly on the sympathy of the stranger and the credulous townsman. They trade profitably, too, more's the pity. One of them died the other day and left $1,000 cash at his lodging.

Begging is forbidden by law. To stand in the street and ask for alms is a crime, but to shuffle along the street whining in sharps and flats is to become an industrious subject. It is the law that forces these repulsive impostors to make a noise. There is nothing more detestable than a pair of these ingrates dragging their slow feet along the muddy roads, rolling their eyes, and screeching "Jesus, Lover of My Soul!"

After their nightly performances they repair to low gin shops, brawl and plan larcenies, which they execute on the way home. It's a wonderful wise thing, is the law!

As for the yelling venders of wares, there's no end to them. Morning and afternoon the milk boys yodel up and down the residential streets. Their din is as frightful as it is unnecessary. Chimney sweeps go along bawling; sooty men driving loads of coal in sacks cry till their throats crack; men who peddle flowers, or vegetables, or pork pies, kindling wood, fruit, cats' meat, evening papers, fly catchers, brooms, penny ices, or who buy old bottles, boots, rags, bags, and pots and pans, keep up their shrieks from breakfast until dusk.

And then the muffin man comes with his bell.

There are several thousands of miles of streets in London, and all of them know these yelling merchants, these squalling beggars, these blatant brass bands, these grinders of pianos.

There are some silly souls who think it would be a pity to do away with all the tumult. Servants encourage the noise. They like it. The mistress of the house may resent the uproar, but the

cook and the housemaid subsidize the uproarious with pennies. They are the chief offenders, but there are householders who combine in the crime.

The piano-organ curse develops yearly. Formerly one piano a day would be trundled through your street, pausing every fifty yards or so to grind out its metallic rattle, but now two an hour is the fair average, and the worst of it is that the two frequently come together and engage in combat at a distance of 100 paces. The effect is madening.

The new dodge is to have a vocalist with each piano. Tongue cannot tell the heinous result of this combination.

The luckless taxpayer casts about for remedy, and finds none. His sleep is broken; his hours for study or quiet work are bombarded with dreadful sounds; he is awakened at untimely hours; his ear knows no rest; he becomes nervous, irritable; he develops a sudden passion for information about Maxim guns and dynamite torpedoes.

The din of the peddlers and the street performers is all but ceaseless. On the three nights of the week when the worse band does not come, the one that's next worse grunts and groans.

Here is a fair day's count from 9 A.M. till midnight: Four brass bands, nine street pianos, five singing beggars, one comic vocalist, a burnt-cork minstrel troupe, a dancing bear led by a man with a drum, a Punch and Judy show with drum, two cornetists, one fiend with a flute, seven milkmen, eleven peddlers, two chimney sweeps, two concertina processions, and three groups of intoxicated choristers. There is something like one disturbance every fifteen minutes for fifteen hours!

What wonder, then, that a Society for the Prevention of Street Noises has been organized? It has not got much further than organization, and it is not likely to become popular, for the world loves noise, in spite of nervous diseases.

But the society proposes action. It will first take cases into court. There it will in all probability be beaten. The liberty of the subject to deafen his fellow subject must not be abridged. That is the way sapient magistrates will rule. If the society would slyly bribe the noise makers to stir their racket before the magistrate's houses—that would be missionary work.

The obvious recourse will be to Parliament.

And who can prophesy what Parliament will do? No doubt the country members like the pandemonium. To them it gives proof

of metropolitan life. Besides, there is no philanthropy in this movement for the protection of peaceable people's nerves. There is no chance for glory in putting the essential bill before the House of Commons, and there are no votes to catch, I fear. It may be that the last resort will be the Maxim gun and the dynamite torpedo.

At any rate, the only chance that the Londoner has for quiet now is to go to prison, or to leave town. In these resorts, however, he could hardly promote his business. The chances are that the noise plague must become much worse before it is abated, but how it can ever be much worse than now one dares not think. Civilization is capable of inventing new terrors.

In no other capital with which I am acquainted are noise mongers so free to disturb the peace. Some kind of check is imposed upon street performers and peddlers; some kind of control is exercised upon them. But in London liberty reigns—liberty to disturb the peace in the name of a lawful occupation. To be sure, the law says that no one may cause an obstruction to foot or vehicle traffic; but of what use is that law in a residential street? It does not meet the case. Salvation Army bands may bang through the thoroughfares as often as they please, and as long as they please. Any band may, and that freedom aggravates the misery of persons predisposed to quiet.

You have heard of "the quiet London Sunday." It does not exist. It may have been known in past years, but it is unknown now. It is a day of street preaching, of pslam singing at street corners, of charity parades, in which workmen's societies, led by bands which have never worked hard enough to master their instruments, career through the town taking up collections. Sunday is the day of the drum, the cornet, and trombone, the tambourine and wheezy reed organ; the day of outdoor exhortation, of labor demonstrations in Hyde Park, and, after 6 P.M., of beery revel in every public house. It is a day of bell ringing. "The quiet London Sunday!"

You who do not know him well are accustomed to think the Englishman a sedate and quiet person, but the Englishman of "the masses" is nothing of the sort. He is the noisiest man alive. He will surpass your Irishman or your Gaul any day in the production of mere sound. He is passionately fond of "demonstrations." He is always demonstrating, always provoking the gods with processions, always holding mass meetings. He is a decidedly emo-

tional creature when he is in a crowd. I grant that it takes a crowd to stir his emotions. When he comes singly, though, he can stir his tongue with energy enough.

Hear him now as he reels home in the small hours, howling the last song of the music halls and awakening everybody in every house that he passes. He meets a dozen kindred souls at a near corner, and, having met, they bawl together.

When you first hear this sort of thing in London you think there is a riot afoot. No riot ever made such a preposterous row. None but the musical cockney in his cups could so shake the heavens with a pair of lungs.

London, in its long history, has suffered many plagues, but its noises surpass the Black Death in terror.

A BRAVE MAN OF SCIENCE.

From the New York Times, "Saturday Review of Books and Art."

But little attention is ever given to the man of pure science, who, when investigating natural phenomena, risks his life. Take the bacteriologist, who handles the most dangerous of microbes. Is it supposable that he leads a charmed life or is ignorant of the risk he runs? How many narrow escapes did Pasteur have? We often entirely overlook the heroism and self-devotion of the experimentalist. Think of the pluck of a man who, not out of bravado, but to prove that he is right, swallows a supposed poison, or inoculates himself with virus in order to show that the nature of the material or its action had been misunderstood, or that by treatment he had rendered himself impregnable.

Sufficient credit has not been given on this side of the water to a brave and cool man, Dr. Foster, who went lately down into a lead mine on the Isle of Man, to find the body of a miner who had been killed during an explosion. Dr. C. Le Neve Foster, as Government Inspector, it may be said, only followed out his duties.

The mine was known to be full of that most poisonous of gases, carbon monoxide. Dr. Foster was accompanied by several other persons. It was found that death was certain did the party remain in the mine. Prior tests with candles had shown that there was not enough oxygen to keep the candles burning.

In coming up, the box holding Dr. Foster and another person became jammed. Death seemed positive—sure to come sooner or later. Nature thus tells the story:

During this time (the jamming of the box) when death seemed to be very near, Dr. Foster made copious notes of his sensations. He commenced writing at 2 P.M., and continued until 3.30, when he was brought to the surface, he being the last to go up. Some of the men were unconscious when brought to the surface, and others arrived in an excited and hysterical condition. The record obtained by Dr. Foster will be a most valuable physiological document, for, judging from the extracts given in the daily press, the gas to which the exploring party was subjected has a peculiar effect upon the mind. As the minutes passed by, Dr. Foster's notes became more and more disjointed, and it is hard to believe that he knew exactly what he was writing toward the end. The following are a few of the notes written while he believed himself to be dying:

"I fear we are all dying. No help coming. * * * The box does not come. In spite of all our ringing for help, it will not come. Capt. Reddicliffe is struggling. No real pain. Good-bye. I feel as if I were sleeping. Again good-bye all! 2.15 P.M.—We are all done. Oh! for the box! It is held in the shaft. * * * It is really like a bad dream. No pain. No pain. For the benefit of others, no pain. * * * 2.25 P.M.—Two of the party are all right. I think they are ringing. When is help coming? The box is gone. Four new men are coming. I don't feel bad. It is strange to write notes while we are dying. What a lot I have written! Capt. Reddicliffe is about the worst. I think he will go first. While there is life there is hope. Good old proverb! Send a note for more brandy. Send for more help. The box has just gone up with Reddicliffe. Williams goes next—he has a capital heart. 2.45—I have written pages. Kewley is a good fellow. There is life in the old horse yet. I feel as if I could sing. God is helping us; he has heard our prayer. My turn to go." Arriving at the surface, and getting out of the box, Dr. Foster, note-book in hand, though weak and staggering, made the entry stating the time at which he got to the top. His last entry was: "Dr. Miller says I must be quiet, but I won't."

We should pass around the name of this brave and cool-headed Englishman—Dr. C. Le Neve Foster. He not only came up the last, but with true scientific eagerness did his best to leave for the instruction and information of others what are the effects of asphyxia on man.

THE TSETSE FLY DISEASE IN ZULULAND.

The tsetse fly disease, called "magana" by the natives, occurs in the horse, donkey, ox, and dog, and varies in duration from a few days or weeks to many months. It is uniformly fatal to the horse, donkey and dog, but of the cattle affected with it few recover. It is characterized by fever, more or less rapid destruction of the red blood corpuscles, extreme emaciation, and infiltration of coagulable lymph into the subcutaneous tissue of the neck, abdomen, or extremities, which consequently become swollen. *Post-mortem* examination shows the presence of a yellow, gelatinous material in the subcutaneous tissue and under the serous covering of the heart, ecchymoses in various regions, and congestion and fatty degeneration of many organs. The tsetse fly (*Glossina Morsitans*, Westwood), is about 11 mm. or seven-sixteenths of an inch in length, and has transparent wings about 10 mm. long. On the upper surface of the abdomen there is a longitudinal yellow line with four yellow lines crossing it at right angles. In 1894 Surgeon-Major David Bruce, A. M. S., discovered that the blood of animals suffering from the tsetse fly disease invariably contained a hematozoon which had not been previously observed in Africa, but which he considers to be either identical with or closely resembling the *Trypanosoma Evansi* found in surra, a disease occurring in India and Burmah; surra, however, as known in India, does not affect cattle. In fresh blood these hematozoa are seen as actively moving transparent elongated bodies, in thickness about a quarter of the diameter of a red corpuscle, and in length about two or three times the diameter of a corpuscle. One end is bluntly pointed and the other is prolonged into a very fine lash, which is in constant whiplike motion; the body is cylindrical and has a transparent, delicate, longitudinal membrane or fin, which is also in constant motion. Surgeon-Major Bruce believes that the fly acts only as a carrier of these microbes from infected to susceptible animals, and does not cause the disease by means of any poison elaborated by itself. A limited number of flies may bite a susceptible animal over and over again without producing any ill effect, but, when a horse is taken into the fly country for even a few hours, or when numerous successive relays of flies freshly caught in the fly country and brought into a healthy district are made to settle on an animal there, the disease is almost inevitably set up. Five

flies kept in a cage with muslin sides were allowed to bite the shaved abdomen of a small dog every two days from September 25th to November 28th, but the animal remained quite healthy. On the other hand, flies which had fed for a short time on a dog affected with fly disease were allowed to bite another dog on November 21st, 23d, 25th and 29th, the effect being that on December 5th hematozoa were found in its blood. In order to show that neither food nor water is the channel by which the disease is conveyed, two healthy horses, provided with network nosebags, were taken into the fly country from 10 A. M. to 4 P. M. on September 19th, 24th, and 29th, but were not allowed to graze or drink. Many flies settled on them and they both contracted the disease, one on October 4th, and the other about October 28th. Another experiment was made by bringing to Ubombo tsetse flies caught in the low country and allowing them to bite a healthy horse; 129 flies were used in this way in ten days, from Novem- 22d to December 14th, the horse fell ill on December 15th and the hematozoa were found in its blood. The source from which the fly obtains the hematozoa still remains to be discovered.—Lancet.

PROF. SYLVESTER'S ABSENT-MINDEDNESS.—Once Professor Sylvester purchased a new pair of trousers and wore them to the university. His wife, who was well aware of his absent-minded habits, knew nothing of the purchase. An hour or so after the Professor's arrival at the university his wife was seen rushing breathlessly down the street with a package under her arm.

Meeting one of the Professors, she inquired hastily and anxiously, "Have you seen Professor Sylvester?"

"Yes," answered the astonished Professor.

"Well, is he all right—is everything all right?" asked his anxious spouse.

"My dear madam," said the Professor, "calm yourself; your husband is perfectly well. I saw him but a moment ago."

"But I mean," said the almost frenzied woman, "did you notice anything peculiar about him? Did he look as he ought to look? Oh, did he—, did he—"

Just then Professor Sylvester strolled around the corner with the new trousers on, to the intense relief of both his wife and the other Professor.—Baltimore Sun.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Acute Entero-Colitis is the subject of a timely article in a recent number of the "Atlantic Medical Weekly," by Alexander Briggs, M. D., of Ashaway, R. I., in which he estimates that over seventy per cent. of deaths from all causes in children under two years of age are due to some abdominal disease, and of this number over thirty per cent. are due to some disease arising from defective or faulty nutrition. Of the predisposing causes of these diseases, perhaps the one that most often enters into the list is injudicious food.

Entero-colitis is a disease wholly distinct from cholera infantum, although it often masquerades under the latter name. The treatment of the disease may best be considered under three heads: Clearing out of the alimentary canal, diet, antiseptis. Among the first symptoms are vomiting and diarrhoea. These are nature's efforts to relieve our little patients, and we can do no better than second her efforts. As soon as we have secured a free catharsis, we should supplement the treatment by antiseptic enemata, with the twofold purpose of flushing out the colon and rectum and for their medicinal action. Nothing has served us better for this part of the treatment than from one to three pints of warm water, to which has been previously added ʒ ii to ʒ iv of Listerine. In the dysenteric variety of the entero-colitis, where there is much straining, persistent tenesmus, and abdominal pain, some of the liquid preparations of opium may be added to these enemata.

In the medicinal treatment of entero-colitis, antisepsis still holds good; benefit will often be obtained from such combination as the following:

Birsmuth subnit..... ʒ iss
Pulv. cret. praep..... ʒ i
Listerine ..... ʒ ss
Aq. menth. pip. q. s. ad..... ʒ iv

Sig. Dose (for a child one year old), one teaspoonful every four hours.

Cleanliness is of the utmost importance in the treatment of these cases. The child should be bathed at least once every day; the napkins after a thorough boiling should be rinsed in warm water, into which has been added some antiseptic; the clothing should be

light and cool, with a flannel band around the abdomen; all long dresses and skirts should be discarded, and the child should not be held in the lap of the nurse long at any one time, as by so doing the heat is materially increased.

PROTONUCLEIN stands foremost among all physiological agents in therapy as a tissue builder. Any condition of the organism which is marked by a lack of nutritive power, or failure to appropriate or assimilate food, calls at once for protonuclein. Under this head come all wasting diseases, all perverted nutrition, all disorders which are attended with anorexia or loathing of food, all conditions attended with flatulence, all biliary engorgements, and finally those conditions which are the *sequelae* of fevers—typhoid, malaria, scarlet fever, measles, etc.

It is well to note that nothing but food material should ever be used with protonuclein. It is not of the nature of a chemical agent with specific and well-known compatibles and incompatibles, but is a distinctively physiological remedy, whose therapeutic effect depends upon the physiological laws of the organism, and like all organic substances must be kept aloof from alcohol and chemical agents. It may be used in connection with other remedies, but should never be administered in the same dose, or given at less than an hour's interval, unless the nature of the other remedy is such as to make it certain that there can be no chemical action.

OEDEMA OF THE LUNGS.—M. J. Renault, in a communication to the Académie de Médecine (Le Progrès Medical, 15th May), shows that, from an anatomical point of view, the acute form of oedema of the lungs described by M. Huchard is as well marked as it is clinically. It is compact, the oedematous parts being of the consistency of jelly, of a slightly violet color, and is permeated by reticular tracts. The portion thus infiltrated sinks in water. There exists a great serous congestion of the alveolar tissue of the lungs throughout the whole of the diseased parts. The alveolar endothelium has entirely disappeared in the parts congested with oedema. The lung is therefore completely destroyed as an organ for conveying air to the system, because the capillaries are compressed. The great increase of the vascular tension in the circulation noticed by M. Huchard corresponds with these lesions. The arterial lesions are of more importance than the renal. If the albuminoid interstitials are more obstructed than other parts by the congestive oedema of the lungs, it is because it reunites more par-

ticularly than any of the others the conditions essential to its production; arteries indurated, myocarditis, the nervous system being under a condition of inordinate disturbance and susceptible, for this reason, of exerting incoherent vaso-motor action, because it no longer exists, no longer is nourished under normal conditions, but constantly receives abnormal excitation from the toxic elements retained in the blood and in the tissues, and this excites it to diapedetic impulse towards the weaker parts of its texture.

without renal lesion.

M. Landouzy reported two cases to show the great importance of the aortic lesions that are capable of producing oedema, even

M. Brouardel, as a medico-legal expert, has found lesions of the kidneys in at least three-fourths of the cases that came under his observation. Often the oedema may arise from some accidental influence, traumatism or cold, which may excite a nephretis which, until then, had remained latent and unsuspected. Death follows sometimes within four hours.

M. J. Renault, while admitting the important influence of Bright's disease a role which is self-evident in consequence of the auto-intoxication calls to mind the fact that the alterations of the kidneys are not always present. It is possible also that the oedema following Bright's disease is a little less rapid in its course.

PERFORATION OF THE STOMACH.—M. Le Dentu reported to the Académie de Médicine (Gazette Hebdomadaire, 9th May) the following interesting case of the surgical treatment of a case of spontaneous perforation of the stomach:

The patient was 36 years of age and had been operated upon twenty-six hours after the appearance of the signs of peritonitis.

The incision indicates the seat of a sub-hepatic perforation of the anterior face of the stomach near the pyloris. Suture of the perforation was impossible and M. Mauclaire tamponed and drained the peritoneum, after having evacuated an enormous quantity of purulent serous fluid mingled with gas from imperfectly digested alimentary substances.

The patient recovered from a prolonged attack of collapse following the operation, the perforation cicatrized and recovery was complete after the treatment, which lasted about a month.

According to the report, two important conditions will materially increase the chances of success in this kind of operations: an exact diagnosis in the beginning, and promptness in performing the operation.

In regard to the diagnosis, two signs are almost pathognomonic: the sensation of pain, coming on suddenly, in the region of the stomach, and resonance in the hepatic zone in consequence of interference with the escape of gas. Unfortunately, these signs are neither constant nor infallible.

In the absence of the classical signs of peritonitis, the study of the pulse, the temperature, the respiration, the voice, the secretion of urine, the condition of the abdominal cavity, the countenance, the color of the skin, the temperature of the extremities, the sensation and the movements of the patient, furnish the only help to the diagnosis, yet they are valuable.

Prompt interference is indispensably necessary. Statistics amply prove its importance. If it be followed in the future the mortality will undoubtedly fall from 60 per cent. to 50 per cent., and probably still lower. The operation must be performed early and quickly; if possible, suture the perforation; beware of copious washing, and use instead dry cleansing for the serous membranes; finally, institute a supplemental sub-pubic or abdomino-vaginal drainage in the female if the pelvic cavity has been the receptacle of any quantity of the purulent serous matter.

PICRIC ACID IN ECZEMA.—M. Ernest Gaucher, in a report to the Société Médicale des Hopitaux (La France Médicale), suggests a new treatment for acute eczema, which he thinks is superior to all other methods hitherto employed.

Assuming, as a basis for his treatment, the special action of picric acid on the epithelial cells, and, also, the efficiency of this agent in superficial burns, he thinks it possible to utilize this substance in the treatment of acute eczema, and in all acute eruptions having the character of eczema.

This treatment has been employed with success by Dr. MacLennan, of Glasgow. As in the case of burns, it is used in the form of an aqueous solution of one per cent., with which a dressing is saturated and applied to the surface, and over this a layer of cotton, or a compress saturated with the same solution may be applied.

He applies the dressing and leaves it in place for two days. At the end of that time the inflammatory symptoms have much improved; the swelling and the exudation are much diminished, sometimes they have entirely disappeared, and the cuticle begins to fall off. The same application is renewed, and the same dressing, every second day and, after a little time, the acute inflammation is

entirely removed. This solution of picric acid has also the very desirable quality of removing the intense itching in a very short time after its application.

This method of treatment is applicable only to the vesicular, or the form known as moist eczema; it may be used when the skin is red and moist, but it is of no value except in the acute stage. In cases of chronic eczema, or those having the characteristics of lichen, the acid will not relieve the itching nor the induration of the skin. It is applicable only in superficial cutaneous inflammations, and especially in disease of the epidermis.

The author thinks it may be employed with advantage in other superficial affections of the skin, when the surface is moist, and especially in all the forms of pemphigus.

Eczema is a very common form of skin disease, and the contributor has employed it in two severe cases with the result given above. Generally a very free use of hydrocyanic acid dilute has given satisfaction, as it does in folicular vulvitis and in similar diseases in which the itching is intense; the solution of picric acid seems to serve the same purpose.

CEREBRO-SPINAL MENINGITIS is reported (New Albany Medical Herald, January, 1897) to be most effectually treated with papine. To a child six years old, a half teaspoonful of papine should be given every one, two or three hours, until he becomes quiet and free from pain, and this effect must be maintained. Papine (Battle's) is recommended above other preparations of opium, because it is freed from convulsive and poisonous elements of opium. In other words, it is a preparation of opium which contains nothing but the pain-relieving and anodyne virtues of the drug, and it is very palatable and most acceptable to the palate of children. To adults it should be given in doses of one or two teaspoonfuls. Each fluid drachm of papine is equal in anodyne effect to one-eighth of a grain of morphine. To act on the bowels we may not give ourselves concern, since agents of this class add greatly to the weakness of the patient and may cause death in this way.

ANTIKAMNIA AND ITS ADVANTAGES.—The "Reference Book of Practical Therapeutics," by Frank P. Foster, M. D., recently issued by D. Appleton & Co., refers to the extensive use of antikamnia as an analgetic and antipyretic. "It acts rather more slowly than antipyrine or acetanilide, but efficiently, and it has the advantage of being free, or almost free, from any depressing effect

on the heart. Some observers even think that it exerts a sustaining action on the circulation. As an analgetic it is characterized by promptness of action and freedom from the disagreeable effects of the narcotics. It has been much used, and with very favorable results in neuralgia, in fluenza and various nervous disorders characterized by melancholia. The dose of antikamnia is from three to ten grains, and is most conveniently given in the form of tablets."

DIURETIN is a recently introduced medicine, prepared by Knoll & Co., in Ludwigshafen, on the Rhine, and so named on account of its active diuretic properties, so described by Professor Adolfo Fasano in the Archivio Internazionale di Medicina e Chirurgia, December, 1896, it is a compound of theonomine with sodium salicylate, a white powder of bitter taste, soluble in half its weight of cold water. Exposed to the air, it readily undergoes alteration.

Diuretin produces two most important effects, the first of which is augmentation of diuresis, which shows itself most decidedly on the third day of the daily administration of the remedy and may go so far as to render the urine of five times the normal amount. On the following days the excessive diuresis is reduced, but it is not until the use of the drug has been discontinued for several days that the urinary excretion falls to the normal quantity.

The other important effect is on the cardiavascular apparatus, augmenting the blood pressure, as the sphygmographic tracings clearly show. Some have denied that diuretin has any cardiocinetic action, but that is an exaggeration. From our practice we are thoroughly convinced that, as Massalongo declares, Knoll's diuretin strengthens the cardiac systole, because theobromine and caffeine have an analogous action. This disputed question is of great importance in interpreting the therapeutic action of diuretin in cardia-vascular affections.

It is commended in parenchymatous nephritis, and in inflammatory affections of the serous membranes, that is, pleurisy and peritonitis. In the acute and chronic forms of those diseases, by the use of diuretin, as by that of other and less potent diuretics and by that of diaphoretics, it is possible to cause the resorption of the effusion, especially if it is serous or sero-fibrinous, and thus spare the patient paracentesis.

The diuretic action of diuretin is generally manifested within 24 hours and reaches its maximum in from three to five days. If no effect is produced during the first week of treatment the case is not a proper one for the use of diuretin.

EDITOR'S TABLE.

SANITARIAN, JULY NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addresed o the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE NEW DISINFECTANT.

Disinfection with formaldehyde gas, has been rendered so easily and so thoroughly applicable, since the process was described by Prof. Robinson and Drs. Schweinitz and Kinyoun, at the meeting of the American Public Health Association, in September last (SANITARIAN for December), that excuse no longer exists for the generally useless sulphur fumigations, which are still persisted in as a mere formal make-believe by some inefficient "health" officers. Lamps and other apparatus for its generation and use, recently constructed, adapt it to some conditions well nigh beyond the reach of other than destructive processes; besides rendering it adaptable to almost all domestic conditions, and without injury to garnished walls, furniture, tapestry or any textile fabrics: Silk, wool, cotton, linen, leather and hair goods have been subjected to it in such strength as to be effectually germicidal without injury to the material.

Prof. F. C. Robinson, Bowdoin College, member of the State Board of Health of Maine, who was among the first to invent a "generator" for evolving the gas, has been also among the first to demonstrate its efficiency. He has described the manner of his having disinfected a house in Portland, as follows:

"The rooms were all taken separately throughout the house (a Portland mansion where there had been three cases of diphtheria, one fatal), one floor at a time, beginning with the basement. The generators were then placed in the halls, all the room doors being closed. The mattresses were left for the most part upon the beds. The closets and bureau drawers were opened, and the bric-a-brac, books and other things were left as they were, with a good chance for the gas to circulate about them. It took about twelve hours to go over the whole house, and nine gallons of alcohol were used, or about one quart to every 2,000 cubic feet of space. Threads infected with diphtheria cultures were placed around in different

parts of the worst rooms between sterilized blotters. Of the twelve cultures made from these every one was sterile."

The Boston Board of Health, under the direction of Dr. Durgin, has been effecting "house-to-house" disinfection with it.

Dr. Doty has recently added it to his *armamentarium* of the New York quarantine facilities. He has on exhibition three large scrap books of samples, which have fabrics of silk, delicately tinted muslins and other stuffs; samples of upholstery, draperies, furs, leather and elaborate wall papers, arranged in three parallel columns to a page. The first column shows the goods before they have been submitted to any disinfection whatever; the second the same goods treated with formaldehyde gas, the third as treated with sulphur. In every instance the samples disinfected with formaldehyde gas have retained their original delicacy of tint and surfaces. Those treated with sulphur are, in many cases, completely destroyed. The gold in wall papers has been faded, and the colors of intricate patterns have run into each other. Literally hundreds of experiments have been recorded in these books, and in every case formaldehyde gas has stood the tests.

While Dr. Doty does not think it can take the place of steam, he believes it to be a valuable adjunct to any disinfecting plant, for the reason that it leaves the finest fabrics uninjured. Steam and sulphur destroy colors and surfaces, and until formaldehyde gas was discovered there was nothing known to science that would kill every germ and still leave valuable articles untouched by chemical action.

Dr. Herman M. Biggs, bacteriologist of the Board of Health of New York, has also had a "formalin chamber" built in the steam disinfecting bureau, in East Sixteenth street, and expects much from it. Owing to imperfect mechanical conditions, however, this plant is not at the time of this writing in good working order, and no definite results have so far been obtained. It is regarded, nevertheless, as a valuable addition to the steam chamber, and practical work will be done on it this summer

Abroad also, since the International Sanitary Congress, at Venice, where it was introduced by Dr. H. D. Geddings, U. S. Navy, and Dr. J. J. Kinyoun, U. S. Maine Hospital Service, American delegates, it appears to be coming into very general use.

The only, but important draw back, thus far—as compared with steam—is its deficiency in power of penetration, and of any means as yet devised to force it into tightly tied-up bundles of clothing, or baled material liable to infection.

Open exposure of the gas appears to be an essential condition to its efficacy. Suitable to this condition several forms of "generators" or lamps have been devised, and are on exhibition by the Sanitary Construction Company, 56-58 Pine street, New York.

One of the most curious and practical is one that stands outside the room to be disinfected, and therefore can be properly regulated and watched. This has a thin pipe running from the cylinder, where the gas is produced from the alcohol, which is intended to pass through the keyhole of a door. In all the lamps, however, the gas is made in much the same way. Wood alcohol is allowed to flow little by little into the bottom of the cylinder of the generator. A few inches above this pan there is a sheet of platinized asbestos, perforated with many small holes. The alcohol is ignited, and in a few moments the asbestos is at a white heat. Then the flame is blown out. The asbestos and the alcohol, both at a high degree of heat, continue to act upon each other, and a vapor results which is allowed to escape through holes in the top of the cylinder in some "generators" and is carried away through a small pipe. Where there is a "formalin chamber" for portable goods the pipe leads directly into this.

THE PROMOTERS OF SMALLPOX, who call themselves anti-vaccinists, have recently received another boost, by the ruling of the Supreme Court of Illinois. By a rule of the State Board of Health vaccination had been made a requirement for the admission of children to the public schools, the local boards receiving instructions from the general body and the boards of education acting as the agents of the Health Commissioner. A citizen of Lawrence County had refused to allow his children to be vaccinated, and had brought suit to compel the officials to accept his children as pupils. May 13, the Supreme Court decided the suit in his favor. It declares that the State Board of Health is without authority to prescribe conditions upon which citizens may exercise rights guaranteed to them by public law, and as the right to send children to public schools is one of those so guaranteed, the rule of the board is arbitrary and illegal.

Of course this decision, while a temporary victory for the promoters of smallpox, does not render the enforcement of vaccination impossible. All that it establishes is the need of a general State law empowering the Board of Health to impose the condition it has tried to enforce without the authority of a statute. Already a bill has been introduced and favorably reported in the

State Senate providing that no pupil shall be admitted to any public, private or parochial school in the State unless he shall present a certificate of vaccination signed by a physician.

The deaths of two children in New York, within two weeks after they were vaccinated, out of 13,822 free vaccinations during the same period, one from croup and the other from hemorrhagica purpura, are harped upon by the smallpox promoters herabouts, as an urgent reason why all children should be left to contract smallpox and distribute it *ad libitum.*

There was indeed no more relation of the vaccination to the causes of death in these children than there was in the case of a boy which we had occasion to cite some time ago, who two weeks after he was vaccinated fell from a peach tree and broke his neck. He was so weakened by vaccination, it was alleged, that he could not hold on!

HOSPITALS IN NEW YORK.—Mr. Thos. G. Wall (Presbyterian Hospital), in a letter to the "Mail and Express," March 15, takes occasion to say that New York requires more charitable aid for the sick—in proportion to its population—than any other city on the continent. It is the goal which the poor of all lands seek in the hope of bettering their lives. Large numbers of them are very poorly nourished when they reach here, and they find it difficult to make a living after they have come. The unemployed are many at all seasons. Ignorance of our trying climate, ignorance of sanitary requirements, insufficient food and more or less improvidence, all go to form a population peculiarly liable to the invasion of disease, and with little power of resistance when seized. If left to care for themselves they will endanger the health of the city. If hospitals do not aid them they will be uncared for, and very many will succumb.

In this city of 2,000,000 there are twenty-six general hospitals, containing 5,279 beds, or one bed for every 379 persons. The city of London, with a population very similar to ours in its general characteristics and its needs, but with a healthier climate, has 120 hospitals, containing 15,102 beds, or one to every 372 of the inhabitants—nearly the same as this city. Comparing New York with the cities of our own State, Utica has one hospital bed for every 216 inhabitants, Rochester one for every 254. With less demand, we would suppose, owing to fewer poor, these cities are better supplied. On the other hand, Buffalo and Albany have each one bed for every 465 inhabitants, and Brooklyn one for every 524.

The poorest supplied of all the cities of the State is Syracuse, with one bed for every 528 inhabitants.

Now, if we accept the statement you mention, that "there are twice as many hospitals as are necessary," or what is the same thing, reduce the beds by one-half, we would have in this city, with by far the largest ratio of those unable to care for themselves in sickness, one bed for every 756 inhabitants, less than half as many as London, one-third as many as are deemed necessary in Rochester, and two-sevenths as many as the good people of Utica think needful.

The population of this city is increasing very rapidly, and no additions have been made to the number of hospital beds for the last five years. If the increase in population goes on as rapidly as in the past, there will soon be a crying need for increase in this department of charity, or the suffering will be great. If it were not for the relief given by the private organizations the accommodations afforded by the city authorities would now be entirely inadequate, and if this private relief is in any way lessened, the demands on the taxpayers will be greatly increased.

RESPONSIBILITY FOR TYPHOID FEVER?—A suit based on the modern ideas in regard to diseases, and in some ways entirely novel, has been brought by Miss Ida E. Sawin, of Somerville, Mass., against Miss Valetta C. Marean, of Hubbardstown, in the same State. Miss Marean owns a hotel at which Miss Sawin, while a guest, contracted typhoid fever. The suit is for $10,000 damages, the plaintiff alleging that her illness was a result of the defendant's negligence in allowing a boy who had the disease to remain in her hotel. It would seem to be a plain case if the facts are as stated.

INSPECTION BETTER THAN ANALYSIS.—The trend of opinion among practical sanitarians at the present day is to the view that analyses of surface (river) waters are of little use in indicating the wholesomeness of the same, but that the proper method is close and continued sanitary inspection of the district through which the water flows, and rigid exclusion of any cause of contamination with the excretions of human beings or domestic animals.—Henry Leffman, Chemist, to Philadelphia Board of Health, in response to a request from the Board of Health of Conshocken, who had sent him samples for examination.

HOW DRUNKARDS ARE TREATED IN DENMARK.—When the police in Denmark find any one in the streets drunk and incapable,

they take him in a cab to the station, where he gets sober under a surgeon's care. On recovering sobriety the police take him home. A bill for the services of the cabman, the surgeon, and the police agents for special duty is then presented to the host of the establishment where the patient took his last drink. In Turkey, if a Turk falls down in the street while intoxicated and is arrested, he is sentenced to the bastinado, which punishment is repeated as far as the third offense. After the third bastinadoing he is considered to be incorrigible, and is called "Imperial," or "privileged" drunkard. If arrested after that he has only to give his name and address, and state that he is a "privileged" drunkard, when he is released and conducted home, the bill for these kindnesses being rendered to him for payment next day.—*British Medical Journal.*

SCRUMPOX is the latest so-called contagious disease which has developed in England. It attacks more especially the "forwards" in football teams, and is the result of rubbing into the skin the dirt from dirty jerseys and sweaters. The appearance presented is that of a multiple pustulation, the contents of the pustule containing streptococcus pyogenus aureus.

QUICK CREAM FOR THE SICK.—A dish of ice cream made in four minutes was a part of a test examination of a class in a sick room cookery recently. Two tablespoonfuls of cream were put in a bowl, sweetened with powdered sugar, flavored with a teaspoonful of clear, strong coffee, and beaten light in a minute with a cream whisk. The cream was then put in a little half pint oyster pail, the cover carefully fitted on. This was set in a quart pail, the space between filled with shredded ice and fine salt. Three minutes turning in this freezing mixture secured a saucerful of smooth coffee ice cream for the imaginary waiting invalid.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Corespondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrams, M.D., Health Officer, reports April: Deaths, 69—19 under five years of age. From consumption, 10; annual death rate, 21.84.

Dallas County, 48,432. J. A. McKinnon, M. D., Registrar (Selma), reports for April: Deaths, 31, death rate per 1,000, 7.24.

CALIFORNIA.—C. A. Ruggles, M. D., President, Stockton; W. P. Matthews, M. D., Secretary, Sacramento. Report delayed.

San Francisco, 360,000. Reports for April: Deaths, 478—104 under five years of age. From consumption, 65; acute pulmonary diseases, 63; from zymotic diseases, 42; diphtheria (and croup), 10, typhoid fever, 5. Annual death rate, 15.84. Contagious diseases reported during the month: Diphtheria, 32; scarlatina, 21; measles, 86.

There seems to be some risk to the public health in consequence of an unseemly conflict between the National and State Quarantine authorities. (Argonaut), June, 7: The steamer Peru arrived last week from ports in China and Japan, which have been declared to be infected. Dr. Chalmers, the State quarantine officer, ordered the mails to be fumigated. The Federal quarantine officer in charge of the fumigating station refused to accept orders from the State quarantine officer, and as he did not deem fumigation necessary, the mails were landed without being fumigated. The State quarantine officer then issued a pronunciamento to the public, in which he said:

"The mails arriving in the city by the steamer Peru were ordered to the Angel Island Quarantine Station for fumigation by me. The Federal officer in charge of the quarantine station declined to receive the said mails, consequently they have been landed unfumigated, as the local Board of Health has not the necessary apparatus for fumigating mail matter."

He proceeds with a touching appeal to the public concerning the necessity for individual fumigation in justification of his *order* to Dr. Blue, the Federal quarantine officer, to fumigate mails.

For a State official to "order" a Federal officer to fumigate mails when he has no authority so to order him, and then to fall back upon the excuse that he did so because the State has no fumigation apparatus of its own, is rather ludicrous.

Los Angeles, 100,000. Reports for April: Deaths, 104. From phthisis, 28; "tuberculosis," 3; acute pulmonary diseases, 10. Annual death rate, 12.48. "N. B.—Of the 28 deaths from pulmonary consumption, as follows: Natives of Los Angeles, 1; natives of the Pacific Coast outside of Los Angeles, 4; from other parts, 23; (of the 28 deaths 21 had lived here less than ten years)."

Oakland. Health Officer Dunn has had his attention drawn to sickness caused by the consumption of strawberries raised by gardeners who have been in the habit of applying arsenic to their

plants. Several people who ate berries secured from the markets have been violently ill from this cause.

COLORADO.—Denver, 160,000. William P. Munn, M. D., Health Commissioner, reports for April: Deaths, 141. Of these 44 were caused by consumption, 35 contracted elsewhere; 33 by acute pulmonary diseases; 1 by diphtheria; 1 by measles; 2 by whooping cough, and the rest from scattering causes. Annual death rate, 10.57 (excluding phthisis contracted elsewhere), 7.95.

Colorado Springs.—Health Officer Grover reports Telegraph, June 8), for May: Considerable measles and whooping cough and one death from the latter disease. There were two cases of typhoid which came from Manitou. There were a total of 24 deaths, of which 11 were from tubeculosis and four from violence. The death rate is 14.4; exclusive of tuberculosis it is 7.8.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven. The Secretary's bulletin for March comprises reports from 165 towns in the State, with an aggregate population of 852,460, from which the number of deaths reported for the month was 1,212—266 under five years of age. The death rate for the larger towns is 17.1; for the smaller, 16.7, and for the whole State, 17.0. Deaths from zymotic diseases, 106—8.7 per cent. of the total mortality; from consumption, 143.

Cases of infectious diseases reported: Measles, 210; scarlatina, 153; diphtheria and croup, 115; whooping cough, 109; typhoid fever, 18.

New Haven, 100,000. F. W. Wright, M. D., Health officer reports for the year 1896, total mortality, 2,019—713 under five years of age. Death rate, 17.72. Zymotic diseases caused 438 deaths. Of these 98 were caused by diphtheria, from 411 cases against 108 for 1895. Typhoid fever has, like many other zymotic diseases, been more prevalent, yet excluding a localized outbreak in August and September, attributed to poisoned milk by washing milk cans with polluted water, the number of cases reported does not greatly exceed the average of previous years. The total number of cases reported was 186 against 102 in 1895. Notwithstanding the number of cases reported in 1896, greater than in 1895, the number of deaths was considerably less, there being 28 and 34 deaths respectively for these years. Deaths from consumption 194.

DISTRICT OF COLUMBIA, 275,000—87,900 colored.—Wm. C. Woodward, M. D., Health Officer.

The sanitary inspectors of the Health Department are engaged, May 24th, in the work of making a house-to-house inspection, in order to get the city in as good a sanitary condition as possible before the hot weather sets in. During the past two weeks the inspectors have found a number of filthy yards and closets, and in cases where the nuisances are not abated within a reasonable time the parties are taken into court. Considerable trouble is experienced where several families live in one house. Under the law, Judge Kimball says he cannot hold the landlords responsible, and in some of the cases the fixing of the responsibility is not an easy matter.

The mortality of the district during the past week, ending June 5, was 94. Of the decedents 42 were white and 52 colored, the death rate being 11.4 for the white, 30.4 for the colored, and 17.4 for the whole population. The principal causes of death were diseases of the circulatory organs, 8 deaths; of the kidneys, 5 deaths, and of the respiratory organs, 21 deaths, of which 12 were from consumption and 6 from pneumonia. Of the zymotic class there were 2 fatal cases of diphtheria, 3 of typhoid fever, and one of whooping cough.

The recently constructed garbage cremator is complained of for its deficiency and offensiveness.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Tallahassee, June 3.—Both houses of the legislature having passed the bill abolishing the Escambia County Board of Health (Pensacola), it seems to be reasonably taken for granted that on the effectual transfer of the quarantine plant to the State, constructed at the expense and listed under the direction of the county board, an appropriation will be made to the county by the State, in remuneration. At a meeting of the State Board, June 9th, the board and the State health officer were very emphatic in their declaration of not wishing to enter into any unseemly controversy over the acquisition of the health management of Escambia County, desiring to carry out what was the evident intention of the legislature, namely, that of placing all health affairs of the State under the direct control of the State board.

Pensacola, 15,000. B. R. Pitt, President of the Board of Health,

reports for May, deaths, 19. Under five years of age, 6. Death rate, 152.

ILLINOIS.—L. Adelsberger, M. D., President, Waterloo; J. A. Egan, M. D., Secretary, Springfield.

Chicago, 1,619,226. A. R. Reynolds, M. D., Commissioner. Report for April: Deaths, 1,728—635 under five years of age. From diphtheria, 47; typhoid fever, 19; consumption, 188; pneumonia, 217; bronchitis, 83; measles, 26. Annual death rate, 13.48.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

The State Board Bulletin reports for the three months ending December 31st, 1896: Diphtheria, 1,741 cases, 508 deaths; scarlatina, 544 cases, 18 deaths; typhoid fever, 383 cases, 244 deaths; whooping cough, 40 cases, 13 deaths; measles, 507 cases, 9 deaths; consumption, 399 deaths; pneumonia, 247 deaths. Total mortality, 3,889.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board Bulletin for May, reports since preceding: Diphtheria, 3 localities; scarlatina in 5; measles in 8; epidemic in Pacific Junction, Hancock, Le Mars and Walnut.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored. Deaths in April, 448; colored, 211; 121 under five years of age, 57 colored. Deaths from consumption, 73; pneumonia, 31; bronchitis, 20; influenza, 4; diphtheria, 3. Death rates—White, 17.66; colored, 31.65: 21.73.

The Board of Health makes grave charges (New Orleans Item), June 4, against the authorities of Mobile, and asserts that while our State Board is "taking every possible precaution to protect against foreign pestilence our own people, as well as the whole Mississippi valley, by sanitary measures which have given such splendid results during the last fifteen years, we find that our quarantine defenses are being undermined by a flank movement, and the public health jeopardized from a direction least expected, but from which, on the contrary, active, friendly co-operation, dictated by mutual sanitary interests, should rather have been expected. That the manner in which the Central American fruit trade is conducted through the

port of Mobile, with or without the sanction of the Alabama and Mobile authorities, which shows that the practice, that now prevails, endangers not only Mobile, but also indirectly, our own city and State. On May 9, ult., thirty persons left Port Barrios on the Mobile boat Managua, nearly all them going to New Orleans from Mobile; the only sanitary requirement being apparently the necessary money to pay the passage, as all classes and conditions were taken aboard."

To this, and to a letter from the President of the La. State Board, Dr. T. S. Scales, Health Officer Mobile Quarantine, replies (Mobile Register), June 9: * * * "I desire to say that as Mobile's splendid results in conducting maritime quarantine will nearly double their "fifteen years of splendid results," I am willing to let the public decide if we are not as competent as the Louisiana officials to determine when the condition ceases to be one of "no importance, perhaps," and this is provided for in our regulations.

"In the face of the fact that our regulations were printed and in full force all last summer, again printed and generally distributed in April last, sent to the president of the Louisiana State Board—the charge of "undermining" is too contemptible to be further noticed. I desire to say, furthermore, that if any of the agents of your board are acting as agents or solicitors of the steamship line, as alleged by the Louisiana State Board, I am not aware of the fact, and any insinuation or statement that it is done with the knowledge, if not the sanction, of the quarantine authorities of Mobile, so far as my position as executive officer may be concerned, I characterize as absolutely false."

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M. D., Health Commissioner, reports for April. The weather: The mean barometric pressure during April was 30.11 inches; mean temperature, 53°; total precipitation, 3.19 inches, a deficiency in precipitation during the month of 0.24 inches; prevailing direction of wind, west. Mortality 674, a decrease of 183 compared with the corresponding month of April, 1896. Of these 514 were whites and 160 colored; a death rate of 14.31 per thousand for the former and 25.87 per thousand for the latter. The death rate per thousand for the whole population was 15.98. Thirty-nine died from infectious dis-

eases, 66 from consumption, 84 from pneumonia, 9 from influenza, 32 from bronchitis, 16 from Bright's disease, 14 from nephritis, 33 from heart disease, 20 from apoplexy and 6 from typhoid fever; 214, or 31.74 per cent., of the total deaths were in children under five years of age. Cases of infectious disease reported, 360, an increase of 44 compared with the preceding month.

A poor leper has been the subject of a very unseemly exception and discussion on the part of the city health authorities. Baltimore Herald, June 9: "Mrs. Mary Sansoni, afflicted with leprosy, came here from Allegheny City, Pa., several weeks ago. Health Commissioner McShane has determined to send her back from whence she came, and alleges as a reason that Baltimore has no means of taking care of the unfortunate, and her retention here thus far has been simply to ascertain if there was any way in which she could be provided for without danger to the community." (Alas! poor Baltimore!) "Further trouble is likely when she is landed in Allegheny City, whose authorities have declared they would not receive her, and would promptly send her back if she is sent there."

And alas, poor Allegheny City!

Both these cities are credited with health departments. For what purpose? Moreover, the contention suggests remarkable deficiency in knowledge of leprosy and its possible danger to the community even with the most ordinary care; such care, for example, as is commonly extended to a case of syphilis in any hospital ward, than which it is no more likely to be communicated to any one else. It is contagious by *actual contact* with the ulcerating surface only.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083. Samuel H. Durgin, M. D., Chairman of Board of Health.

During the month of April there were 1,073 deaths, of which number 359 were under five years of age. Annual death rate, 24.74 per 1,000. Deaths from diphtheria (and croup), 49; scarlatina, 28; typhoid fever, 11; cerebro-spinal meningitis, 7; influenza, 3; consumption, 118. Cases reported: Diphtheria, 305; scarlatina, 281; measles, 804; typhoid fever, 34.

Lowell (Citizen), June 9: Typhoid fever is the subject of much concern. Twenty-three cases since the first of January. Seventeen have occurred among operatives employed in the mills. Last

year there were 178 cases of fever. Of the total 81 were among operatives, about 40 were among children from twelve years downward. There were 36 deaths. In the last of January it became necessary to open the river gate and let the water flow to the pumps from whence it was sent up to the city reservoir. In consequence of that, in February there were 57 cases, 31 of them among operatives. In March there were 17 cases; 8 operatives. In April the number dwindled to 7, of whom 2 were operatives. In May there were 12 cases; 2 operatives. In June 6 cases, 3 operatives. In July 8 cases, 1 operative. In August 10 cases, operatives unknown. In September 21 cases, 12 operatives. In October 8 cases, 5 operatives. In November 5 cases and December with 7. There were only two operatives afflicted in those months. The figures for the present year showed a great reduction, only 23 cases in five months, and yet it is too much, when the purity of the water supply is considered.

The water supply is now believed to be above reproach, no longer from the river but artesian well water. Yet, says Mr. Mills, agent of the locks and canals, and a member of the State Board of Health, every corporation in Lowell is supplied with water at the sinks in the rooms, which is pumped from the canal. This is used for washing and cleaning and is not intended to be drunk at all. But they drink it and die from the fever it brings. It is a deadly poison. Something should be done to remove the danger; the mill men will do anything the Board of Health may suggest.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

For the month of May, 1897, compared with the preceding month, influenza and pleuritis decreased in area of prevalence.

For the month of May, 1897, compared with the average for May in the eleven years 1886-1896, measles were more prevalent and intermittent fever, consumption and erysipelas were less prevalent.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of May, 1897, at 180 places; measles at 160 places; diphtheria at 50 places; scarlet fever at 36 places; typhoid fever at 32 places; whooping cough at 18 places, and smallpox (suspected) at 1 place.

Reports from all sources show consumption reported at 14 places more, measles at 2 places less; diphtheria at 1 place more, scarlet fever at 6 places less; typhoid fever at 4 places more and whooping cough at 8 places more in the month of May, 1897, than in the

preceding month. Smallpox was reported present at the same number of places.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602.—H. N. Avery, M. D., Commissioner, reports for April: Deaths, 156—43 under five years of age. Deaths: consumption, 19; typhoid fever, 22. Annual death rate, 8.84.

St. Paul, 215,582.—A. J. Stone, M. D., Commissioner. Mortality for April, 116—36 under five years of age. Deaths from typhoid fever, 2; diphtheria, 1; consumption, 19; pneumonia, 10. Annual death rate, 6.46.

Report for 1896: Deaths, 1,434—195 less than in 1895, the reduction being almost entirely due to the decrease in the number from infectious diseases. From diphtheria and membraneous croup, for example, there died during the year 72, in comparison with 107 for 1895. It is, however, not alone from diphtheria that the general mortality has decreased. From cholera infantum there were 44 deaths, as compared with 79 deaths for 1895. There died from meningitis only 55 as compared with 83 deaths for 1895. In scarlet fever the mortality still remains low as compared with that of other cities. Still, there is an increase of 2 deaths over 1895, with a decrease of 44 in the total number of cases reported for the year. The mortality in typhoid fever continues about the same, there having died during the year 37, as compared with 38 for 1895. From pneumonia there died only 145, as compared with 173 deaths from that cause in 1895. It is also pleasing to note that the number of deaths from tuberculosis was only 200, as compared with 242 for 1895. Annual death rate, 6.67 per 1,000, on estimated population of 215,582.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for April: Deaths, 783—168 under five years of age; from zymotic diseases, 60; diphtheria, 10; whooping cough, 2; typhoid fever, 4; phthisis, 80; pneumonia, 167. Annual death rate, 15.6.

Report for the year ending March 31, 1896: Total mortality, 9,425—715 more than for preceding year. Death rate (560,000), 16.83, of colored people, 37.04; 3,373 deaths, or 36.8 per cent., were of children under five years of age. Deaths from zymotic diseases (exclusive of consumption), 1,865, chiefly: diphtheria (and croup),

693; diarrhoeal diseases, 651; malarial fever, 155; typhoid fever, 107. Deaths from consumption, 1,000—10.06 per cent. of the total mortality. Deaths from pneumonia, 678; bronchitis, 397.

Kansas City, 165,000.—E. Von Quast, M. D., Health Officer, reports for March: Deaths, 165—45 under five years of age. Deaths from diphtheria, 2; typhoid fever, 4; phthisis, 12; tuberculosis, 10; pneumonia, 23. Annual death rate, 12.0.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Paterson, 106,248.—J. L. Leal, M. D., Health Officer, reports for April: 166 deaths—54 under five years of age. Anual death rate, 15.61. Deaths from diphtheria, 15; consumption, 18; pneumonia, 18.

Newark, 230,000.—Health officer Chandler reports for the four weeks ending May 29: Deaths, 295—90 under five years of age; from diphtheria, 19; consumption, 37; pneumonia, 28; other respiratory diseases, 28. Annual death rate, 16.41.

Hudson County (Jersey City and vicinity), 355,231.—W. W. Varick, M. D., President.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for April reports the number of deaths in April, 10,325, a daily average of 344, against 373 in March, the death rate having fallen from 20.50 per 1,000 population annually to 19.00, there having been 1,200 fewer deaths. From zymotic diseases the number of deaths in the two months was exactly the same, though relatively more in April from the decrease in deaths from other causes. The decrease has been in acute respiratory diseases, from which there were 700 fewer deaths, other local diseases showgin no change in mortality except diseases of the circulatory organs, which the average of past years shows to cause the greatest number of deaths at this season (March and April). There is also a decrease in the mortality from old age and from unclassified causes. Compared with April, 1896, the total mortality is a little smaller, the zymotic mortality being less, and that from acute respiratory diseases being decreased by 200, other local diseases being somewhat increased. It is estimated that the grippe epidemic, which has caused during the preceding three months 2,500 deaths, of which 1,500 occurred in March, exaggerated the mortality of this month by about 500 deaths. Measles continues throughout

the State, but it is causing a much smaller mortality than a year ago. Smallpox caused 7 deaths in New York City. Other zymotic diseases have an identical prevalence with last month and that of April, 1896; 9.5 per cent. of the deaths were from these diseases, 10.5 of the deaths in urban parts of the State being zymotic, and 6.5 in the rural. Consumption caused 1,158 deaths, 11.5 per cent. of the deaths of urban and 10.3 per cent. of the rural districts being from this cause. The central part of the State shows the lowest mortality from acute respiratory diseases. The temperature during the month was warmer than the average, the mean being 46°, the rainfall, 2.80 inches, was slightly in excess, one-third of the days were clear and the average humidity low.

New York City, 1,905,000.—Report for April: Deaths, 3,318—1,201 under five years of age. Death rate, 20.24. Zymotic diseases, per 1,000 from all causes, 115.35; diphtheria, 159; typhoid fever, 10; cerebro-spinal fever, 27; consumption, 400; acute respiratory diseases, 598; diarrhoeal diseases, 47. For the four weeks ending April 23 the school inspectors found 29,091 children set aside by their teachers as fit subjects for medical examination. Of these 1,400 were sent home for various causes. Among them the 1,400 had every disease that childhood is heir to.

Brooklyn, 1,100,000. Report for April: Deaths, 1,716—603 under five years. Death rate, 18.8. From zymotic diseases, per 1,000, from all causes, 1,037; diphtheria, 88; typhoid fever, 6; consumption, 181; acute respiratory diseases, 367.

Buffalo, 350,000. Report for April: Deaths, 358—118 under five years. Death rate, 12.2. From zymotic diseases, per 1,000 deaths, from all causes, 145.2; diphtheria, 17; acute respiratory diseases, 74; consumption, 40; typhoid fever, 3.

Rochester, 170,000. Report for April: Deaths, 190—27 under five years. Death rate, 13.4. From zymotic diseases, per 1,000 deaths from all causes, 80; consumption, 24; acute respiratory diseases, 40; diphtheria, 7.

Albany, 100,000. Report for April: Deaths, 180—40 under five years. Death rate, 21.6. From zymotic diseases, per 1,000 deaths from all causes, 90.0; typhoid fever, 8; diphtheria, 2; consumption, 25; acute lung diseases, 33.

NORTH CAROLINA.—George G. Thomas, M. D., President, Wilmington; Richard H. Lewis, M. D., Secretary, Raleigh.

May Bulletin summarizes reports from 24 towns, with an aggregate population of 73,322 white and 55,163 colored, for the

month of April: Deaths, 60 white, 86 colored—46 under five years of age. Death rates, respectively, 98., 188., 137. The chief causes were: From consumption, 21—13 colored; pneumonia, 22. 15 colored; heart disease, 11; brain diseases, 9.

Meteorological summary for the month: Mean barometer 30.14 inches; normal for April 30.04. Highest barometer 30.68 on the 21st at Raleigh. Lowest barometer 29-60 on the 9th at Charlotte. Mean temperature 57.6 degrees; normal for April 57.9. Highest temperature 91 on the 30th at Greensboro. Lowest temperature 22 on the 21st at Linville. Average rainfall 3.68 inches; normal for April 3.78 inches. Greatest monthly rainfall 10.57 inches at Lynn; least monthly rainfall 0.98 inches at Edenton. Average number of clear days 16; partly cloudy 7; cloudy 7; rainy 8. Prevailing wind direction southwest. Average hourly velocity 8.7 miles. Normal direction for April southwest; normal velocity 8.8 miles per hour.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst. M. D., Secretary, Columbus.

Cases of and deaths from infectious diseases reported to the State Board of Health during the four week ending April 24, 1897: Diphtheria, 86 cases, 19 deaths; scarlatina, 104 cases, 5 deaths; typhoid fever, 90 cases, 19 deaths; whooping cough, 23 cases, 2 deaths; measles, 376 cases, 2 deaths. Aggregate population represented, 1,234,477.

June 9th (Columbus Journal), the Secretary gives a brief summary of the use of antitoxin, as follows:

There were 1,475 cases of diphtheria and membranous croup treated without antitoxin, of which number 250, or 16.9 per cent., died. There were 1,052 cases treated with antitoxin, of which number 136 died, or 11.9 per cent. 277 cases showing extension of the disease to the air passages in which antitoxin was not used, resulting in 153 deaths, or 55.2 per cent., and 341 such cases treated with antitoxin, of which number 93, or 27.3 per cent., died; or, subtracting 19 deaths where antitoxin was given too late to be of benefit, 76 deaths, or 23.6 per cent. 23 cases were not treated with antitoxin where intubation was performed. Of the number 16 died, or 65.2 per cent. Of 72 cases receiving antitoxin, intubation being performed, 24 died, or 33 per cent.

Cincinnati, 405,000. J. M. Withrow, M. D., Health Officer, reports for April, 473 deaths—130 under five years of age. Annual death rate, 14.01. From consumption, 71; pneumonia, 63;

bronchitis, 28; zymotic diseases, 45—diphtheria, 8; typhoid fever, 5.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports for April: Deaths, 409—147 under five years. From diphtheria, 5; typhoid fever, 9; consumption, 20; tuberculosis, 27; pneumonia, 42; bronchitis, 8. Death rate, 14.02.

Toledo, 137,780. J. T. Woods, M. D., Health Officer, reports for March: Deaths, 152—42 under five years of age. Death rate, 13.3. Deaths from consumption, 7; diphtheria, 4; typhoid fever, 2.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793. Theodore B. Stulb, Health Officer, reports for five weeks ending May 29: Deaths, 2,191—596 under five years of age. From diphtheria, 118; typhoid fever, 68; consumption, 234; pneumonia, 286.

Pittsburg, 285,000. Report for the four weeks ending May 29: Deaths, 402—142 under five years of age; typhoid fever, 17; consumption, 37; diphtheria, 9. Death rate, 14.43.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for five weeks ending May 9: Deaths—151—40 colored. Under five years of age, 70. Annual death rate—white, 14.6; colored, 31.4: 23.0.

Mortality for the year 1896: Total, 1,869—1,348 colored. Death rates per 1,000: white, 18.04; colored, 37.14: 28.68. Deaths under five years of age: white, 152; colored, 508. Deaths from typhoid fever, 44; diphtheria, 7; diarrhoeal diseases, 228; consumption, 288.

TENNESSEE.—J. A. Albright, M. D., President, Somerville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin for May 20 reports: The principal diseases, named in the order of their greater prevalence in the State, for the month of April were lung diseases acute, measles, malarial fever, typhoid fever, consumption, la grippe, rheumatism, scarlet fever, diphtheria, mumps, dysentery, whooping cough and smallpox.

Memphis, 56,134—27,561 colored. Board of Health reports for May: Deaths, 88—48 colored. Of these 25 died from general diseases, 6 of nervous diseases, 4 of circulatory diseases, 8 of respiratory diseases, 21 of digestive diseases. Annual death rate, per 1,000, including non-reidents, white, 16.80; colored, 20.90; total, 18.81. Of residents only, white, 11.34; colored, 15.68; total, 13.47.

UTAH.—Salt Lake City, 48,076.—W. T. Dalby, M. D., Commissioner, reports for April: 38 deaths—9 under five years of age. Annual death rate per 1,000, 6.71. From consumption, 2; diphtheria, 1; typhoid fever, 1; pneumonia, 8.

WASHINGTON.—Spokane ("Review"), May 27: Measles, diphtheria and scarlatina are all epidemic in this city. There are now 55 quarantined cases of communicable diseases in the city, of which 44 are of measles, 7 of diphtheria and 4 of scarlatina.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 275,000.—Walter Kempster, M. D., Commissioner of Health, reports for April: Deaths, 289—108 under five years of age. From diphtheria, 5; measles, 4; consumption, 36. Annual death rate, 12.61 per 1,000.

MANITOBA.—Winnipeg ("Free Press"), June 8: Typhoid fever epidemic. Provincial health authorities have received information that there are at present 97 cases of typhoid fever at Rat Portage. Seventeen fever patients from that place are now in the general hospital here.

VITAL STATISTICS OF LARGE CITIES.

Glancing over the volume of vital statistics of the census of 1890, of the twenty-eight cities in the United States which in 1890 had each a population of 100,000 and over, and an aggregate of 9,697,960, the total number of deaths registered of this population during the census year was 209,653; 21.62 to each 1,000 inhabitants. Eight of the twenty-eight cities had a higher death rate than this, while Philadelphia falls a fraction below the average with a death rate of 21.29 per 1,000.

The variation in the death rate in the six large cities on the Atlantic Coast has varied greatly in the sixteen years between 1875 and 1890 inclusive. These cities are Boston, New York, Brooklyn, Philadelphia, Baltimore and Washington. During this period Boston's highest death rate occurred in 1875, when it reached 30.05 per 1,000 of population. Philadelphia's maximum occurred in 1876, the hot Centennial year, when 24.44 deaths per 1,000 of population were recorded; and its minimum rate happened in 1879, when a death rate of 18.69 deaths to each 1,000 was recorded. No other large city on the Atlantic Coast showed so low a death rate

as this between 1875 and 1890. New York's highest death rate was 31.30 in 1881, and its lowest 23.39 in 1877. But the widest variation in the death rate was in Boston, where it ranged from 30.05 per 1,000 of inhabitants in 1875 down to 21.16 in 1879.

The relation of mortality to the seasons shows that—taking the nine cities, Boston, New York, Brooklyn, Philadelphia, Baltimore, Washington, Cincinnati, Chicago and St. Louis—for all ages January is the most unhealthful month and November the most healthful when measured by the number of deaths. The average death rate in these cities was 28.31 per each 1,000 inhabitants in the first month and in the second month 16.40 per each 1,000. For children under five years of age, July, with a death rate of 132.75, was the most fatal month, and November the least fatal.

Of suicides in these nine cities, the percentage was greater among barbers and hairdressers than among people engaged in any other occupation, the rate being 52.85 per 1,000 deaths from all causes. The next largest percentage was among saloonkeepers, bartenders and tailors. The class of people least inclined to suicide appear to be draymen, hackmen and teamsters, the percentage among them being only 3.19 per 1,000 deaths from all causes.

Old age is credited with 3,149 deaths in the twenty-eight largest cities during the year. The death rate per 100,000 of population 60 years and over was 657.83 in Philadelphia, 684.66 in Boston, 566.92 in New York, 613.12 in Baltimore and 664.47 in Chicago. This death rate is larger among the colored population than among the white. The highest was in Louisville, where the rate was 76.34 and the lowest in St. Louis, with a rate of 6.64.

NEGRO MORTALITY.

Pertinent to the recent announcement of a special effort by the Louisiana State Board of Health to overcome the conditions productive of the excessive mortality among negroes in New Orleans, attention is invited to the following extract from the census of 1890, showing the need of like effort elsewhere:

	White	Colored
New York	28.47	37.41
Chicago	21.03	23.30
Philadelphia	22.28	32.42
Brooklyn	25.41	34.99
St. Louis	18.15	34.55
Boston	24.62	33.29

Baltimore	22.61	36.41
San Francisco	23.57	24.06
Cincinnati	21.93	33.04
Cleveland	21.83	31.63
Buffalo	19.83	34.22
New Orleans	25.41	36.61
Pittsburg	21.56	29.16
Washington	19.79	38.00
Detroit	20.36	00.00
Jersey City	27.48	29.60
Louisville	19.61	31.98
Providence	21.97	34.81
Indianapolis	17.78	30.04
Allegheny	20.06	24.13

It appears, therefore, that the death rate of negroes is higher in New York and Washington than in New Orleans, and that in other cities, such as Baltimore, Philadelphia, St. Louis, and Providence, it is almost as high. The matter of real interest, therefore, consists in the fact that every city shows a larger rate of mortality among the blacks than among the whites, being in Washington almost twice as large. It is in this revelation that authorities should find the stimulus to a more vigilant inquiry and the inspiration of more intelligent and determined action. There can be no doubt that the enormous percentage of mortality among the negroes is almost wholly due to the unsanitary conditions which surround them, and the unwholesome food which they live upon.

MORTUARY STATISTICS ABROAD FOR THE FIRST QUARTER, 1897.

Population, total mortality, annual death rate per 1,000, and deaths from typhoid fever, diphtheria, acute lung diseases and consumption:

London, 4,463,169; 20,504; 18.4; 127; 668; 3,872; 2,085. Glasgow, 714,919; 4,781; 26.7; 41; 72; 1,252; ? Liverpool, 633,078; 3,772; 23.8; 26; 33; ?; ?. Manchester, 534,299; 3,128; 23.4; 34; 13; ?; ?. Birmingham, 505,772; 2,640; 20.9; 23; 57; ?; ?. Leeds, 409,472; 2,053; 20.1; 11; 17; ?; ?. Sheffield, 351,848. 1,627; 18.2; 16. 11; ?; ?. Dublin, 349,594; 3,488; 39.9; 40; 27; 755; 329. Edinburgh, 292,364; 1,632; 22.3; 7; 26; 323; 151. Belfast, 281,431; 2,204; 31.3; 64; 8; 670; 308. Nottingham, 232,934; 1,200; 20.6; 16; 6; ?; ?. Bristol, 232,242; 1,172; 20.2; 3; 12; ?; ?. Bradford, 231,260; 1,050; 18.2; 7; 7; ?; ?. Hull, 225,045; 971; 17.3; 10; 9; ?; ?. Newcastle, 217,555; 1,018; 18.7; 10; 7; ?; ?. Salford,

213,190; 1,227; 23.0; 15; 14; ?; ?. Leicester, 203,599; 877; 17.2; 13; 14; ?; ?. Portsmouth, 182,585; 768; 16.8; 4; 4; ?; ?. Cardiff, 170,063; 691; 16.3; 3; 18; ?; ?. Brighton, 121,401; 462; 15.2; 4; 8; ?; ?. Norwich, 110,154; 512; 17.7; 3; 1; ?; ?. Plymouth, 97,658; 523; 21.4; 2; 1; ?; ?. Amsterdam, 495,683; 2,205; 17.8; —; 52; ?; ?. Rotterdam, 286,910; 1,362; 19.0; 4; 40; ?; ?. La Haye, 187,845; 760; 16.2; 5; 11; ?; ?. Paris, 2,511,629; 12,745; 20.3; 49; 109; 1,927; 2,439. Lyons, 466,767; 2,481; 21.3; 22; 23; 536; 399. Bordeaux, 252,102; 1,411; 22.4; 15; 2; 229, 173. Lille, 216,276; 1,219; 22.5; 4; 11; 219; 193. Saint-Etienne, 135,784; 707; 20.8; 1; 3; 147; 87. Nantes, 125,757; 784; 24.9; 8; 2; 149; 121. Le Havre, 119,470; 780; 26.1; 12; 6; 84; 171. Rouen, 112,657; 918; 32.6; 7; 7; 148; 133. Reims, 108,943; 615; 22.6; 4; 10; 79; 95. Nancy, 96,306; 568; 23.6; 7; 2; 99; 89. Besancon, 57,556; 337; 23.4; 3; 0; 66; 43. Pau, 33,012; 165; 20.0; 1; 1; 66; 43. Berlin, 1,708,499; 7,265; 17.0; 12; 131; 893; 1,072. Hambourg, 641,780; 2,683; 16.7; 9; 41; 384; 414. Munich, 418,000; 2,449; 23.4; —; 37; 308; 365. Leipzig, 413,529; 1,912; 18.5; 12; 53; 272; 274. Breslau, 367,769; 2,254; 24.5 4; 29; 299; 372. Dresden, 347,485; 1,787; 20.6; 2, 31; 246; 233. Cologne, 331,000; 1,584; 19.1; 6; 58; 174; 219. Frankfort-on-Main, 244,889; 955; 15.6; 1; 6; 170; 176. Hanover, 220,644; 887; 16.1; 3; 9; 180; 115. Magdebourg, 218,284; 1,044; 19.1; 3; 28; 171; 124. Dusseldorf, 185,911; 873; 18.2; 2; 34; 143; 111. Koenigsberg, 176,320; 1,044; 23.7; 10; 14; 240; 119. Nuremberg, 168,564; 959; 22.8; —; 12; 128; 174. Chemnitz, 168,004; 1,010; 24.0; 1; 23; 87; 101. Altona, 150,747; 752; 20.0; 3; 6; 117; 104. Charlottenbourg, 149,958; 580; 15.5; 1; 18; 121; 60. Stettin, 148,481; 806; 21.7; 2; 19; 109; 100. Stuttgart, 146,661; 650; 17.7; —; 7; 89; 101. Breme, 145.385; 646; 17.8; 2; 15; 120; 102. Elberfeld, 143,593; 600; 16.7; 3; 9; 108; 72. Strasbourg, 139,413; 727; 20.8; 3; 26; 134; 103. Barmen, 130,428; 558; 17.1; 2; 9; 110; 89. Dantzig, 127,272; 800; 25.1; 2; 19; 187; 60. Halle, 121,024; 630; 20.8; —; 35; 96; 65. Brunswick, 119,600; 536; 17.9; 4; 7; 92; 93. Aix-la-Chapelle, 112,793; 593; 21.0; 1; 15; 122; 66. Crefeld, 107,837; 475; 17.6; —; 16; 51; 65. Mannheim, 101,857; 463; 18.2; 1; 10; 75; 88. Essen, 101,644; 467; 18.4; 7; 10; 119; 66. Mayence, 77,643; 359; 18.5; —; 4; 64; 54. Metz, 59,671; 268; 18.0; 3; 0; 52; 36. Berne, 48,328; 265; 21.9; 1; 6; 48; 36. Bale, 78,860; 384; 19.5; 1; 10; 50; 63. Geneva, 80,111; 421; 21.0; —; 4; 52; 82. Lausanne, 36,619; 174; 19.0; —; 4; 30; 27. Zurich,

126,497; 596; 18.8; 4; 17; 66; 90. Chaux-de-Fonds, 31,175; 123; 15.8; —; ?; 10; 18. Vienna, 1,542,294; 9,040; 23.4; 11; 199; 1,839; 1,754. Buda-Pesth, 592,528; 3,747; 20.2; 31; 52; 702; 637. Prague et faub, 369,494; 1,962; 21.2; 18; 29; 252; 313. Gratz, 120,882; 910; 30.1; 4; 5; 107; 175. Brunn, 101,360; 753; 29.7; 3; 15; 127; 149. Cracovie, 81,400; 676; 33.2; 9; 26; 109; 143. Pilsen, 56,777; 340; 24.0; 1; 7; 49; 42. Linz, 51,296; 410; 31.9; 4; 4; 29; 75. Copenhagen, 333,714; 1,647; 19.7; 4; 27; 202; 240. Stockholm, 267,100; 1,226; 18.4; 3; 3; 216; 208. Gothembourg, 114,512; 702; 24.2; 8; 17; 80; 112. Christiania, 182,856; 806; 17.7; 8; 6; 126; 159. St. Petersbourg, 954,400; 7,387; 31.0; 275; 341; 307; 1,115. Moscow, 753,469; 6,957; 36.9; 90; 191; 229; 962. Varsovie, 553,643; 3,036; 21.9; 28; 48; 731; 332. Venice, 163,254; 900; 22.1; 8; 5; 225; 90. Brescia, 67,707; 459; 27.1; 3; 2; 107; ?. Bucharest, 206,000; 1,712; 33.2; 19; 34; 294; 280. Brussels, 190,313; 833; 17.5; 7; 6; 110; 132. Anvers, 262,255; 1,054; 16.1; 8; 10; 202; 120. Liege, 163,207; 617; 15.1; 2; 8; 108; 59.

For the Fourth Quarter, 1896:

Bordeaux, 252,102; 1,273; 20.2; 11; 2; 130; 162. Nantes, 125,757; 686; 21.8; 6; 5; 79; 111. Limoges, 76,439; 419; 21.9; 2; 2; 55; 96. Breslau, 367,769; 2,247; 24.4; 8; 30; 229; 386. Triest, 161,836; 1,168; 28.2; 14; 47; 191; 172. Rome, 471,801; 2,193; 18.6; 40; 14; 353; 239. Milan, 443,252; 1,883; 17.0; 49; 52; 351; 181. Genes, 211,151; 1,081; 20.5; 9; 12; 195; 146. Florence, 192,482; 873; 18.4; 18; 3; 115; 84. Venice, 161,636; 811; 20.1; 15; 8; 108; 103. Boulogne, 149,088; 816; 21.9; 16; 7; 120; 85. Padoue, 80,787; 499; 24.7; 9; 4; 45; 55. Brescia, 67,707; 362; 21.4; 8; 0; 53; 37. Parme, 52,196; 287; 22.0; 8; 2; 46; 39. Le Caire, 353,188; 4,142; 44.1; 22; 70; 1,072; 330. Alexandrie, 181,703; 2,170; 47.8; 30; 65; 373; 168. Damiette, 43,502; 187; 17.2; ?; ?; 41; 10. Suez et Ismailia, 12,406; 179; 57.7; —; 3; 21; 9. Port Said, 10,693; 286; 107.0; —; 4; 56; 12.

THE PLAGUE.—Bombay, 821,164. Total number of deaths reported for the four weeks ending April 27, 3,484—1,282 from plague.

YELLOW FEVER is increasingly prevalent in Cuba. In Havana, during the week ending May 27, there were 75 new cases reported and 19 deaths—all of which occurred among Spanish soldiers in the military hospitals.

SMALLPOX also continues prevalent in Havana—40 new cases and 5 deaths reported during the week ending May 27.

THE HEALTH OF THE CITY OF MEXICO.

The heavy rains setting in at this time mean a decided improvement in the sanitary condition of the city; the air is literally washed of street dust which, lodging on roofs and cornices, is, in dry weather, blown into the houses, carrying with it an infinite number of minute and often perilous organisms. What street dust contains the researches of a group of Italian physicians at Turin have demonstrated. The importance of street watering and frequent sweeping cannot be exaggerated.

The rains carry off a great accumulation of noxious matter which, in dry months, clogs the sewers, and diseases endemic here lose their virulence in the summer and early autumn. This fact should convince everybody of the necessity of maintaining a continual flow of water in the sewers in the dry months. There can be no doubt that even those of us who escape fevers and other diseases induced by the undrained condition of the city do not altogether avoid the consequences of unhygienic municipal conditions. There is a distinct lowering of the tone of the human system when long exposed to miasmas, even though the body may be vigorous enough to resist them to the point of preventing the outbreak of a fever. Every medical man knows that when the system is debilitated here (and the rule holds good everywhere), then disease finds easy entrance.

Our climate is not a bad one for people who live properly and maintain a generous diet. Exercise is imperatively demanded in a climate where the tendency is to sedentary habits and indolence. The long list of sturdy foreigners, many years here, who have kept up an out-of-door habit of life persistently, shows that there is no reason why, with care, men and women should not be strong and well in the Valley of Mexico. When the sewer system of the city is reconstructed, this ancient town should become one of the healthiest on the planet. As we are, the powerful tropical sun purifies the air, and acts as a great disinfecting agency. Give us a month of clouded sky, and the mortality rate would run up alarmingly. Luckily for the city's health, there are a few days when the sun does not exert his cleansing influence.—Herald, Mexico, June 5, 1897.

BUENOS AYRES.

"Annuarie Statisque de la Ville de Buenos Ayres." 8 vo. pp. 602.

The tables are complete — climatology, metreology, barometrical, thermometrical and heliometrical observations, made at the chemical laboratory of the city for 1895. The chemical constituents—ozone, carbonic acid, free ammonia, organic ammonia in the air, bacteriology of the air, analysis of rainfall—and all these are given monthly by the chemical department of the municipal laboratory. A record of the rainfall monthly for the previous forty years for the city and the surrounding district completes that section.

Monthly statistics of immigration and emigration; increase of population from that source as compared with native increase.

The population in 1895 was 677,786, and the extent 18,141 hectares; which gives 36.5 inhabitants to each. Paris has an area of only 7,802 hectares and a population of 2,424,705, which gives 310.7 to each hectare. If the city increases at the present rate for the next twenty-five years, in 1915, the centenary of national independence, the population will be 1,300,000, and the density 74 to the hectare.

In all cities the specific density varies with the locality. In Paris it is 733 in the Arrondissement du Temple, while it exceeds 1,000 in the Quartier Bonne-Nouvelle. In London, in 1881, the population in the district between Bethnal Green and Regent's Park was 500 to the hectare; in the Kensington district, 200, while in the southeast, Levesham, it was 13.

Of the foreign population, the Italians were the most numerous, 43,527: next, the Spaniards, 40,790; then the French, 13,154.

Buenos Ayres is destined by nature to be the emporium of South America because it is the key to the geographical situation which unites it with Paraguay by river navigation and to Peru and Chili by land communication.

Births registered in 1895, exclusive of still-births, 26,767, or 13,622 males, 13,145 females.

Demography—Births following number for each mother, the nationality and age of mother. First confinement, under twenty years, 483; from 20 to 25 years, 601; from 25 to 30 years, 181, etc., to 45 years; total, 1,335. Second confinement, under 20 years, 200; from 20 to 25 years, 678; from 25 to 30 years, 275; from 30 to 35 years, 90, etc.; total, 1,272. Third confinement, under 20 years, 45; from 20 to 25 years, 512. Fourth confinement, under

20 years, 1. Fourteenth confinement, 20; fifteenth, 7; sixteenth, 4; seventeenth, 4; eighteenth, 4; nineteenth, 1, and twentieth, 1 mother between 40 and 45 years of age. Illegitimate births—native mothers, 1.3 per cent.; illegitimate births, foreign mothers, 0.4 per cent. Twins, 231 confinements—217 males, 245 females.

A table shows the births for every 1,000 women between 15 and 50 years in European countries, in three classes. In the first class, 150 births to 1,000 women; the Slavs, Croatians, Hungarians, then the Saxons, Bavarians, Wurtemburgians and Prussians; next the low countries — Cis-Lethian Austria and Italy. In the second class, 130 births; England, Scotland, Belgium, Alsace-Lorrain, Spain, Portugal, Roumania, Finland, Norway and Denmark. In the third, 120 or less; Sweden, Greece, Switzerland, Ireland and France. Ireland has been drained of her marriageable people, most of whom have come to the United States to increase the birth-rate.

Buenos Ayres has a birth rate of 160.5 to every 1,000 women betweeen 15 and 50 years.

Marriages; nationalties of individuals, ages of contracting parties, etc..

Diseases in all their forms, in all conditions at all ages.

The death rate in 1887 was 27.50 per 1,000; in 1895 it was 22, while in London it was 19; in Paris, 21; in New York, 21, and only 13.68 in Montevideo.

In Buenos Ayres 23.72 per cent of the deaths were under one year; in London, 25.52; in Paris, 14.74; in New York, 26.09; in Brooklyn, 25.26.

Foods of all kinds—animal and vegetable—classes and quantities of each consumed.

Liquids of all kinds examined at the municipal laboratory:—Wines, liquors, water, mineral water, milk, beer, etc.

The city railroads carried 84,991,868 passengers during the year.

The post received or dispatched 41,598,004 letters and 34,214,426 pieces of printed matter.

During 1895 the hospitals received 19,266 patients, 16,817 were discharged and 2,238 died.

In asylums for children 4,378 natives were admitted; 30,123 foreigners, of whom 29,816 were of immigrants.

The bacteriological laboratory is complete and efficient. During the year 575 specimens of sputa were examined, 1,865 of urine 342 of false membrane, 16 of pus, 12 tumors, 3,020 of pathological specimens and fecal matter.

Criminal establishments, reformatories and education are treated in detail.

T. P. C.

BOOK REVIEWS.

A Handbook of Medical Climatology, Embodying its Principles and Therapeutic Application, with Scientific Data of the Chief Health Resorts of the World. By S. Edwin Solly, M. D., M.R. C.S., Late President of the American Climatological Association. In one octavo volume of 470 pages, with engravings and colored plates. Cloth, $4.00. Lea Brothers & Co., Publishers, Philadelphia and New York, 1897.

The author of this work has been long known as a student and practical observer of medical climatology, most of all in the medium and high altitudes of Colorado, which, more than any other section on the North American Continent, has attracted the attention of physicians and invalids as a resort for consumptives. But while this work supplies needful information on the medical climatology of the whole Rocky Mountain region to a degree greater than any other hitherto published, this is but comparatively a small part of the work. It comprehends the principles and therapeutic application of climatology universally in apposition with regional and local conditions generally, domestic and foreign. To this end, it comprehends a summary of the differential relation of climate to the human constitution generally, with a collation and comparison of climatic observations from all parts of the world; from which and his own extensive observations, he deduces practical conclusions so classified as to render them alike applicable to physiological conditions and pathological indications; insomuch that the chief health resorts treated of may be estimated and applied according to their well-defined properties, rather than—as has been too much the case hitherto—by mere scenery at the risk of health.

Pioneers of Evolution from Thales to Huxley. With an Intermediate Chapter on the Causes of Arrest of the Movement. By Edward Clodd, President of the Folk-lore Society, author of "The Childhood of the World," "The Story of Creation," "The Story of Primitive Man," etc. With Portraits. 12mo., pp. 280. Price, $1.50. New York: D. Appleton & Co.

Not Darwin and Spencer, but *their* pioneers, is the particularly entertaining subject of this book, because the readers of scientific books are already generally informed about these latter-day pioneers and their works. Besides, they have not yet been canon-

ized as have been the old scientific saints of the sixteenth century, who set the world a-wheeling on its axis and ultimately routed the learned men of the Church.

The word "pioneer," the author takes pains to remind us at the outset literally means a foot-soldier; one who goes before an army to clear the road of obstructions. And it is with singular timeliness that the first chapter so opportunely tends to intensify our sympathy with the Greeks, even in their present dilemma; because from among them came the first "foot-soldier" of evolution of whom we have any record. The author tells us that, "While the Oriental shrunk from quest after causes, looking, as Professor Butcher aptly remarks in his 'Aspects of the Greek Genius,' on 'each fresh gain of earth as so much robbery of heaven,' the Greek eagerly sought for the law governing the parts around him. And in Ionia was born the idea foreign to the East, but which has become the starting point of all subsequent scientific inquiry—the idea that Nature works by fixed laws. Sir Henry Maine said that 'except the blind forces of Nature, nothing moves which is not Greek in its origin,' and we feel how hard it is to avoid exaggeration when speaking of the heritage bequeathed by Greece as the giver of every fruitful, quickening idea which has developed human faculty on all sides, and enriched every province of life." The earliest school of scientific speculation, we are told, was at Miletus, and was founded by Thales, who flourished in the sixth century before Christ. "That nothing comes into being out of nothing, and that nothing passes away into nothing, was the conviction with which he and those who followed him, started out on their quest." And it appears to be the cornerstone of the structure upon which the leading evolutionists of the present day are engaged.

The work is divided into four periods: I. Pioneers of Evolution from Thales to Lucretius, B. C., 600-A. D., 50. II. The Arrest of Inquiry, A. D., 50-A. D., 1600. III. Renaissance of Science, 1600 onward. IV. Modern Evolution—1 Darwin and Wallace; 2 Herbert Spencer; Thomas Henry Huxley. Each of these periods is lucidly described in intimate association with the conditions of the second and in relation with the conditions that characterize the third period, and the forcefulness of the personnel by which the other periods are characterized.

The justification for including Lucretius, the Roman exponent of evolution, is found in his two signal contributions to the science of man: the primitive savagery of the human race, and the origin

of the belief in a soul and a future life. He was born in Stagira, Macedonia, 384 B. C. Whence in his eighteenth year he went to Athens, where he became a pupil of Plato. But these periods and leading names are the mere indices of the scope of the work. It deals with the conditions under which the "pioneers" pursued their investigations and the obstacles against which they had to contend, particularly with the arresting force of Christianity, A. D., 50-400, on which the author switches off into a somewhat detailed acount of the rise and progress of the Christian religion, which he seems to hold responsible for the lack of scientific progress during that period and the succeeding ages to A. D., 1600; and still an obstacle. Nevertheless, the Christian at this day, can well afford to read and compare what the author says in this respect, and reflect with satisfaction on the conservatism of Christianity when science was a very small infant, for which the civilizing force of Christianity in overcoming paganism did more towards opening the way for scientific progress than all other forces combined, notwithstanding its conservatism. Considering the constantly increasing number of Christians who accept evolution, Christianity can no longer be considered an obstruction to scientific progress in that direction, or any other. Indeed, the heartiness with which many Christians are engaged in the study of archaeological revelations, shows them to be actual contributors rather than obstacles to scientific progress.

On the whole, the book is one which advocates, skeptics or opponents of evolution or of Christianity, may alike read with edification and profit.

THE TWELFTH AND THIRTEENTH ANNUAL REPORTS OF THE BUREAU OF ANIMAL INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, for the Fiscal Years 1895 and 1896. Washington: Government Print.

A volume of 362 pages, comprehending reports and papers with appropriate and lucid illustrations on the more important operations of the Bureau of Animal Industry for the years mentioned, although the results of many investigations have been published in special bulletins and are not included. An interesting article has been inserted on the "Contagious Diseases of Animals in Great Britain," which gives important information concerning the history of these diseases and the methods adopted for their control. This was compiled from English authorities. The article by Dr. Theobald Smith on "Investigations of Diseases of Domesticated

Animals" completes his series of reports on investigations made by him while Chief of the Division of Animal Pathology. His studies of sporadic pneumonia and the points of difference between sporadic broncho-pneumonia and contagious pleuro-pneumonia are of great interest and value, as they illustrate the cause for the difference of opinion which has existed between American and English inspectors as to the nature of the disease in American cattle landed in Great Britain, which the inspectors of that country assumed to be contagious pleuro-pneumonia.

The articles on infectious leukaemia in fowls, tuberculosis in swine, leeches and rabies, represent heretofore unpublished work of the pathological laboratory, which is of considerable importance from economical and sanitary points of view, and commendable to sanitary officers and veterinarians.

THE HYPNOTIC MAGAZINE is among the recent additions to our exchange list. It is published primarily in the interest of the medical profession, designed to be the connecting link, as it were, between physical and psychical pathological treatment. Measured by the half a dozen numbers received since its first issue, in October, it is a lively expression of current thought on a subject which has long been of interest to, but too little regarded by medical practitioners. The influence of the mind upon the body is indeed a long since recognized condition common to mankind, and was the subject of a deeply interesting treatise by Daniel Hack Tuke, M.D., twenty-five years ago, and of which there was a second edition, thirteen years ago (Henry C. Lea's Son & Co., Philadelphia). But that work appears to have laid the foundation of the subject only—submitted to the profession—the author's object being, as stated by himself, "to lay down and illustrate certain psycho-physical principles which appear clearly recognizable in the light of modern physiology." Knowledge of this physiological condition and these principals have greatly advanced since the publication of that volume, and they find their expression in the periodical before us. The leading articles of the June number are Therapeutics of Hypnotism, by Thomas Bassett Keys, M. D.; Reports of Cases Treated, by Drs. Herbert A. Parkyn and F. A. Walters, and an Editorial on Education During sleep.—The Hypnotic Magazine: Devoted to the Investigation of the Science of Hypnotism, its Uses and Abuses and its Therapeutic Possibilities. Edited by Sydney Flower, M. D. Published monthly. $1.00 per annum. The Psychic Publishing Co., Chicago, Ill.

VICTORIA THE GOOD.

By Alfred Austin, Poet Laureate of England.

The dew was on the summer lawn,
  The roses bloomed, the woods were green,
When forth there came, as fresh as dawn,
  A maiden with majestic mien.
They girt a crown about her brow,
  They placed a scepter in her hand,
And loud rang out a nation's vow,
  "God guard the Lady of the Land!"

And now the cuckoo calls once more,
  And once again June's roses blow,
And round her throne her people pour,
  Recalling sixty years ago;
And all the goodly days between,
  Glory and sorrow, love and pain,
The wifely mother, widowed queen,
  The loftiest as the longest reign.

She shared her subjects' bane and bliss,
  Welcomed the wise, the base withstood,
And taught by her clear life it is
  The greatest greatness to be good,
Yet while for peace she wrought and prayed,
  She bore the trident, wore the helm
And, Mistress of the Main, she made
  An Empire of her Island Realm.

So gathering now, from near, from far,
  From rule whereon ne'er sets the day,
From Southern Cross and Northern Star,
  Her people lift their hearts and pray;
Longer and longer may she reign
  And, through a summer night serene
Whence day doth never wholly wane,
  God spare and bless our Empress-Queen!

(*From the Independent, June 17, 1897.*)

THE WHITE GLOBULES, OR LEUCOCYTES.

"These cells are the only ones of the animal tissue which possess the power of individual movement. They are formed of a mucous matter which they can stretch out in the form of tentaculae, or arms, toward the point where they desire to go. They fix one end, and contract so as to dr[illegible] themselves gradually along. Now, when they find a bacillus in their neighborhood they shape their course towards it; they seize it in one of their tenacles, draw it to themselves, or rather they inclose it in their own jelly, and incorporate it. They then begin upon a second or third, so that the white globules can sometimes be seen to be stuffed and swelled by the bacilli.

"It is not, however, from a desire to serve the animal that the white globules thus behave. The microbe is to them an agreeable food, which they slowly digest, and little by little cause to disappear, shredding it up and separating it into granules, and completely annihilating its every trace. It is a true digestion, which can be followed by the eye applied to the microscope, and by the aid of an infusion of coloring matter, which fades away from the microbe, becoming paler and paler as the digestion approaches completion, leaving at length only the gelatinous substance of the white globule.

"Moreover, we do not only profit by the cannibalism of the white globules. They act as a permanently circulating police, floating in the blood and thus reaching the most remote parts of the body.

"They have, moreover, the faculty, discovered by Cohnheim, of leaving the blood-vessels and penetrating the tissues, constantly making their round, and always finding something to do. And in addition to these flying columns are stationary bodies of troops, attached to the liver, the marrow of bones and nervous centers or ganglions, which pounce on any unwary bacilli which pass their way. And the defense of man against the destroying bacillus is really dependent on the agencies which keep the white globules well and active. Certain things disagree with them; cold paralyzes them, and delivers the patient they would otherwise have saved over to the enemy. Nothing is commoner than to hear the winter cold accused of having brought about an inflammation of the lungs, or an attack of influenza, or an epidemic of diphtheria. How does a lowered temperature really act? Certainly not by creating the microbes of these various maladies. It can only have favored their development; and this it has accomplished by chilling and

aralyzing the white globules."—Reviews of Reviews for June, rom an article by M. Duclaux, Revue de Paris.

ATTEMPTS AT A PHYSIOLOGY OF MIND.—The older psychology nd philosophy had always maintained the necessity of directly nvestigating the facts of consciousness. The standpoint was imple enough, but, as no scientific methods of doing so were de- eloped, the whole problem remained vague and unsatisfactory. Among the proposals for a better state of affairs was that of first nvestigating the nervous system and then deducing psychological aws therefrom. The brain was to be accurately mapped out into aculties, the paths of nervous currents were to be traced along arious fibers, and the interaction of nervous molecules was to be nown in every particular; it was even expected that various cells ould be cut out, with a memory or a volition snugly inclosed in ach. In other words, there was to be no psychology except on he basis of a fully developed brain physiology. Unfortunately, ery little has been ascertainable concerning the finer functions of he nervous system. Aside from a general knowledge that the erebellum has to do with co-ordination of movements, the convo- utions of Broca have to do with speech, and similar facts, nothing f even the remotest *psychological* bearing has been discovered oncerning the functions of the brain. The roseate hopes of those ho expected a new psychology out of a "physiology of mind" ere totally disappointed. In the effort for something new, how- ver, the psychologist supplied the data concerning the "mole- ular movements" in the brain out of his own imagination; the miliar facts of mind are retold in a metaphorical language of nerve currents," "chemical transformation," etc., of which not one article had a foundation in fact. The physiology of mind started ith an impossibility and ended with an absurdity.—From Sources of the New Psychology," by E. W. Scripture, in Apple- on's Popular Science Monthly for May.

The June installment of Professor Ripley's series on "The Racial eography of Europe," in "Appletons' Popular Science Monthly," oints out the usual teachings in geographies and histories regard- ng the unity of the European or white race are quite at variance ith the facts, and that instead of a single European type, there are nmistakable evidences of at least three distinct races.

WHAT SHOULD CHILDREN LEARN?—Every teacher ought to be philosopher. Every child already is one until conventionality oils him. More than that, he is also scientist, poet and artist in

embryo, and would mature in all these characters if we did not stunt him with our bungling. When teachers are as wise as they may be children will be helped to learn everything as soon as they begin to learn anything.

I do not say that grammar and geometry and geography and geology, history and economics, and psychology and ethics as such should be taught in the nursery. I do say that in the cradle the child begins to be in contact with that nature and society of which all these are phases and products and reports. Sociology demands for the child, from the cradle to his second childhood, opportunities for such frank contact with life that its various aspects will confide to him their mystery in its real relations with the other elements of life. Sociology demands of the tutors and governors who lead the child through the formal part of education, that they shall so discreetly pilot Wilhelm Meister through his apprentice years that he may learn his world at the smallest expense, and with least cause for regret, both to others and to himself. Whether this citizen of the world shall ever learn to construe life in terms of the conventional sciences is an entirely secondary matter. The main thing is that, from the beginning, he shall learn to know himself and his world truly—so far as he knows at all—in all essential relations. This involves the learning of such sciences as he does require, in the character of excerpts from the whole book of knowledge, not as self-sufficient knowledges.—Professor Albion W. Small, in the American Journal of Sociology for May. University of Chicago Press.

How Children's Eyes Should Be Tested.—The means to be provided must be accessible to the masses, easy of application, considerate of popular prejudice, and effective of results.

The method is, briefly, as follows: An oculist is to be appointed by the Board of Education, whose duty it shall be to lecture to the principals upon the elementary facts in ocular anatomy, physiology, and hygiene, and upon the uses and application of the test types, etc., making a practical demonstration of the method upon some fifty pupils.

The principals shall thereafter annually report their work to the Superintending Oculist, who shall submit such statements, with his conclusions, to the Board of Education. A Snellen test card is provided for every building, with some accompanying printed matter.

They involve but slight expense, which should not exceed sev-

enty-five dollars in a city of two hundred thousand people.—From "Defective Eyesight in American Children," by Dr. Frank Allport, in June Review of Reviews.

SUMMER RESORTS.—The Medical Record, of June 12th, is a number of unusual magnitude and interest. It will surely keep all summer on the table of every physician who would possess a ready reference for reply to the inquiries of his patients where to go to escape the city oven in July and August. Moreover for himself, when, on finding the number of his patients at home reduced to a minimum, he would quickly select the place he would like to fly to, and measure the distance and the time it would take to reach it, so as to have the longest possible vacation, he need only refer to the Record—*record* indeed it is, of the whole category of summer resorts, with just so much about them as will enable him to choose the one for himself, as for his patient, best adapted to his present needs. And besides all this about summer resorts there is an excellent article on "The Science of Climatic Conditions in Relation to Health," by Gen. A. W. Greely, whilom officer in charge of the meteorological service of the United States, from which the following is extracted:

"While the ability of man to withstand the vicissitudes of climate over the whole earth is unquestioned, yet it is realized that there is a practical limit of environment within which he is competent to perform that quality and quantity of work and to live out that span which is evidently the birthright of the normal man.

"It is interesting to note that the only extended and satisfactory investigation of the geographic distribution of life in North America has been made by Dr. C. Hart Merriam, of the United States Department of Agriculture, and this study, excluding man, has reference only to forms of animal and plant life.

"While the medical profession awaits investigations that shall outline in like manner the areas in which human life can best thrive and develop, yet no doubt obtains that the principles which dominate in the case of lower animals and plant life must to some extent be important factors in determining the congenial habitat of mankind.

"It has been claimed that deaths arising from heat are in inverse order to the humidity, but this rule does not hold good, as shown by the data herewith. The area over which very excessive death rates obtain during the heated periods extends from New York City westward through the Ohio and lower Missouri Valley. In

these latter two regions the air is comparatively dry, and as we go southward to the Gulf, with increasing humidity and higher mean temperature, we find them marked by a diminished death rate, at least so far as is directly traceable to extreme heat. One, therefore, seems to be warranted in the belief that the temperature dangerous to mankind is that in excess of the temperature of the human blood, and that when the air temperature runs for a considerable number of hours above 98° F. the fatal effects of the great heat necessarily follow. It is obvious that casualities from the intense heat are greatly increased by the unsanitary conditions of life in the great cities, so that it is hardly possible to assign a suitable weight to unfavorable temperature conditions and to insanitation. It is evident, however, as has been shown elsewhere, that injury to public health comes rather with the summer heat than with the winter cold.

"In *resume*, it appears that the extreme heat of summer is injurious to human health in the United States, except along the immediate ocean coasts, in northern New England, in the lake regions, and on the elevated lands, say, from five hundred to two thousand feet; the elevation necessarily decreasing with the latitude and increasing with the distance from the sea.

"Temperature conditions are ameliorated or aggravated by humidity conditions. Very dry air and great temperature changes, diurnal and annual, obtain to the westward of the Mississippi River and over the mountain peaks of the Atlantic coast. As a rule, the air increases in dryness in its distance from the oceans and within the law; but it is hoped that it will be renewed.

"The attitude taken by the meteorological side of the weather bureau as to the influence of climate upon health cannot be more forcibly illustrated than by the statement that the Monthly Weather Review for August, 1896, contains no allusion to the fact that nearly one thousand persons died in the United States in that month from the direct effects of a prolonged heated term."

HOME DUTIES OF INDIAN CHILDREN.—There are home duties as well as pleasures for the children. Boys are required to look after the ponies, to lend a hand in planting, to help in the harvest; and they are often made to do active duty as scarecrows in the newly planted field, where, like little Bo-peep, they fall fast asleep. The girls help to gather wood, bring water, and look after the younger ones. As they grow older they are taught to cut, sew, and make garments. In former days, the old Omahas say, no girl

was considered marriageable until she had learned to tan skins, make tents and clothing, prepare meat for drying, and could cultivate corn and beans; while a young man who had not learned to make his own weapons and to be a skillful hunter was not considered fitted to take upon himself the responsibilities of the provider of a family.—"Home Life Among the Indians," by Alice C. Fletcher, in the June Century.

CRETE AND ITS NATIVES.—The peculiarly favorable position of the island, situated at the junction of three continents, as it were, and commanding the coasts of all three, has invested it from the earliest times with an importance such as neither Sicily, Sardinia, nor Cyprus, although much larger in area, ever attained. While forming in prehistoric times a stepping-stone for Egyptian and Asiatic civilization in its progress toward the shores of Greece, Crete remained throughout antiquity singularly free from any close political connection with Egypt, Asia or Greece. This insularity is to this day one of the marked characteristics of the Cretan people; and without accepting the view that they are the purest descendants extant of the Hellenes of the 8th century B. C., we must regard them, nevertheless, as one of the most interesting branches of the Greek race. Unfortunately, the gravest defects of the ancient Greek character were nowhere so pronounced as in Crete; and we are told that its history throughout antiquity was one continuous chain of civil strife, carried on with a savageness and bitterness of animosity exceeding all that was known in the rest of Greece. This political depravity was attended by such a degeneracy of morals as to render the name of "Cretan" a synonym for nearly every vice.—"Crete, the Island of Discord," by Demetrius Kalopothakes, in the May Century.

AMERICA'S SHARE IN THE CUBAN SHAME.—During the forty years that have since elapsed all the interested powers have recognized expressly or implicitly the position that was then publicly assumed by our government. So, however unpleasant it may be, we must admit that when the consular representatives of France and of England in Cuba say, as I have heard many of them say, in commenting upon the unparalelled horrors of the situation, that the government and people of our country are directly responsible for all the bloody crimes that are committed in the name of warfare, they are right. I believe that our share of responsibility for all this blood guiltiness is a heavy one. We have announced our

peculiar rights as to Cuba; we have said to other nations that they must keep their hands off; we block the way and stop all interference, and assist Spain the while to encompass her ends by the activity of our fleet and the exertions of our Federal officers.—From "The Real Condition of Cuba To-day," by Stephen Bonsal, in May Review of Reviews.

THE LIVING AGE, in entering its fifty-fourth year, seems to have entered a new career of prosperity and popularity. Among the evidences of this is the opening of new departments which enable it to cover a much wider field than ever before. Of the quality of the contents, it is enough to say that it well maintains its former high standard. It could not do more. In the course of a year, aggregating over three thousand double column, octavo pages of the choicest reading that can be obtained; and the price is only $6.00 a year. The Living Age Co., Boston.

THE OPEN COURT for June contains a handsome portrait of Pythagoras, reproduced from an ancient cameo. The main article is on "The Life of Pythagoras," by Professor Moritz Cantor, of Heidelberg, Germany, the great mathematical historian, who has constructed an extremely lifelike and attractive picture of the great Grecian thinker. The editor discusses "The Immorality of the Anti-Vivisection Movement." He regards certain features of the anti-vivisection crusade as extravagant and, in so far as the sentiment on which it is based is unreasoned, he views it as immoral. He takes as his text the article "In the Dissecting Room," in the same number, where the ethical and utilitarian aspects of dissection are considered. The Open Court Publishing Co., Chicago. Single copies, 10 cents. Annually, $1.00.

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THE SANITARIAN.

AUGUST, 1897.

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PHYSICIANS AND THEIR ARMAMENTARIUM.*

THE OLD SCHOOL AND THE NEW.

BY JOHN A. TANNER, M.D.

It was with hesitation and no little fear I accepted the invitation to deliver the annual address before this society, feeling that in this day of so much writing and talking upon medical matters, it would be a difficult task to bring to your attention a subject not already worn threadbare, or advance ideas with which you are not familiar. Since undertaking the task it has been my regret that I did not decline the compliment. Hence it is that this address does not open by saying that "It is with great pleasure I appear before you on this occasion." However, to-day it will be my endeavor to give you a few thoughts, and possibly set you to thinking upon the subject of

THE OLD AND THE NEW.

The limited time at my disposal will prevent any detailed discussion of the many thoughts of interest brought to the mind by such a subject, so only a few of the most salient points, and those bearing especially upon the general practitioner and his field of work, will be briefly discussed.

This topic was not selected with the view of contrasting the so-called Old School with the catchingly named New School of medicine, for practically to-day there is no difference and hence nothing to contrast but the names, the homeopathic practitioners, with but few exceptions, using, as far as they know how, remedies in the same doses and upon the same therapeutical bases as the regular physician.

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This statement is made advisedly, and is based upon such facts as the following:

1. The following prescriptions written by different members of the Homeopathic Medical Society.

R. Sulphate of morphia tablets.....gr. $\frac{1}{8}$.
S. One every four hours until relieved.

R. Antikamnia tablets.....gr. v.
S. One every half hour until relieved.

R. Maltine with iron, quinine and strychnia.
S. One teaspoonful after meals.

R. Hydrochloric acid, dilute.
S. Three drops in water before meals.

2. Have a well-known homeopath attend in an emergency one of your patients, and proceed immediately to give morphia hypodermically for an attack of cholera morbus.

3. An examination of the catalogue of the Boston University School of Medicine, probably the leading homeopathic college in the country, will show in use for "general reading and reference," Pepper's "System of Medicine," Lusk's and Playfair's "Obstetrics," the "United States Dispensatory," and other works by well-known authors in the regular profession. With such data before us, we must consider that while there was an old school of pure homeopathy, to-day there is virtually a new school of homeopathy, whose members cling to the name for public effect, though otherwise they are in no sense of the word practitioners of what they pretend in holding to the name homeopathy.

The members of the arbitrarily named "Allopathic" school have never claimed any designation but that of physicians, holding to no exclusive dogma and refusing to follow the dictum of any one man, but reserving the right to use any or whatever system and remedy seems best. How often do we now hear quoted the following words of wisdom as emanating from some physicians of the new school of medicine: "I use whatever I can that I think will help my patient." This expression seems to serve as a motto with many homeopaths to be used on selected occasions to convey the idea that they have discovered an advanced and elevated plane of work. What a change!

It is not necessary, in order to contrast the past with the present, to speak of medicine as taught and practised one hundred years

ago, nor even fifty years ago. We need not go back beyond the experience of some of you present, for in the past thirty years so many new theories have been advanced, such a number of new remedies introduced, and such improvements brought forward in the methods of diagnosis, and the general management of the sick, we are now seemingly dealing with almost a new *art;* not science, for medicine has hardly reached that point yet. Instruments of precision have been multiplied in every branch, and those known before have been vastly improved. Take, for example, the clinical thermometer—what a difference between the old, slow and clumsy thermometer, with its difficult-visible mercury column, which had to be read before removing the instrument from the point of application, and the present neat, rapid, self-registering thermometer, with the easily read magnified index. Again, contrast the old pewter-barrel enema syringe with its large wooden piston rod and twine-wrapped piston, with the succeeding light and easily worked hard-rubber syringe, and then the bulb syringe with its flexible tubes, and finally the too convenient and very efficient fountain syringe. How would the present advocates of the wholesale irrigation of the genital tract of the lying-in patient manage, if they had to use the hard working and clumsy pewter-barrel syringe?

Electricity, either of galvanic, statical or magnetic origin, has been peculiarly favored with its numerous advocates for ages as a remedy of mysterious power for many and widely diverse affections, and in recent years it has had its apostle and his disciples, who were stanch believers in it as a cure for uterine tumors, but at present its use as an actual remedy seems to be about abandoned, except by a few who use it as a card and as an effect. Now, it has taken its place as a valuable agent to give an easily controllable heat to the many forms of neat and durable platinum points for the actual cautery, instead of the crude irons heated in the ordinary fire. Then it furnishes light with but little heat to the various bulbs used in illuminating the cavities for exploration, even enabling the surgeon to illuminate the female bladder, so as to catheterize the ureters and thus determine if one or both kidneys are diseased. The culminating point would seem to be reached in the application of this agent through the accidental discovery of the efficiency of the X rays as a means for the visual examination of the bones in fractures and for the discovery of foreign bodies in the soft tissues.

77208

DRUGS AND MEDICAL PREPARATIONS.

Passing from this necessarily brief mention of instruments, we will now turn our attention to drugs, and medicinal preparations in general.

The advances in chemistry, especially organic chemistry, in recent years, have been marked and rapid, and while not very many years ago a chemist was a rarity, devoting his time to his favorite study purely from scientific motives, and was looked upon as dealing with the mysterious, to-day chemistry is a popular profession, many members of which are using their scientific knowledge for the production of industrial commodities in all branches of trade, and conspicuously those of pharmacy. Hence, instead of depending upon the old-time druggist who laboriously prepared the medicinal preparations used, necessitating the giving by the physician of pills that tasted, and draughts that nauseated, we now to a great extent depend upon the large manufacturing pharmaceutical concerns, employing skilled chemists, who vie with each other from purely commercial considerations, in placing before us the many elegant preparations in the liquid form, and the numberless combinations in the sugar or gelatine coated pills, or the seductive tablet triturates, and the various forms of gelatine capsules. When we write a prescription now, the accurate old-time pharmacist who learned his business by a long apprenticeship and close study, is no longer with us to put it up, but a Phg., a graduate in pharmacy, from one of the many Colleges of pharmacy which have appeared in recent years, a purely theoretical man, will handle it, either using some one of these elegant compounds of the manufacturing chemist, or will make it up from extracts, tinctures or powders obtained from these manufacturing pharmacists, and of guaranteed purity and strength when bought from reliable concerns.

It is the skilled chemist we have to thank for these palatable preparations, and it is to him we look for the purity and strength of our old-time remedies.

Every good, sooner or later, seems to be followed by an offsetting evil, and we are now meeting with breakers due to these very improvements.

In the first place, the theoretical graduate pharmacists, while replacing the apprenticed pharmacists in person, have not entirely taken their places in care and skill, and it is necessary that we follow up our prescriptions and see that they are correctly compounded.

In the second place, the rapid increase in the number of these large establishments has produced so much competition as to be the cause of placing upon the market goods of inferior quality. Then they are putting out so many combinations and are forcing them upon the notice of physicians by such a flood of literature, and so many glib talking canvassing agents, both male and female, it is difficult for a physician to keep from becoming a mere routine practitioner, using this or that much-praised combination which seems to fit the case, without a careful fitting of the ingredients of the prescription to the individual case after a tedious and searching inquiry.

The convenient, palatable and cheap tablet triturates, embracing nearly every remedy, and a great many combinations, are especially conducive to carelessness in prescribing. When a case of neuralgia is met with, without searching for the cause, one is apt to turn to these triturates and give, say, Brown-Sequard's neuralgia tablet; or, if it is a dyspeptic patient, Fothergill's anti-dyspeptic tablet sounds well and is prescribed, and so on with other affections, a corresponding tablet bearing some noted physician's name being used, Sequard, Fothergill and other names of note virtually prescribing some make of tablets through us as dispensing agents.

Do we get as good results from medicine put up in the form of tablets as we would from the liquid preparations? Some few medicines will bear being put up in this way, and will give full action, but it is absurd to compound combinations containing volatile substances in triturates and expect them to hold. Tablets of paregoric or brown mixture, both containing camphor, and other tablets containing carbonate of ammonia, certainly cannot retain full strength and give the same results as these preparations in the liquid form. Will a tablet triturate, purporting to equal one minim of tincture of aconite, or tincture of belladonna, or tincture or nux vomica do the work of the actual tincture? Compressed tablets are convenient, and when dissolved before administering are all right, but it is hardly good prescribing to have a patient swallow whole a tablet of bromide of potassium, or chloride of ammonia, or salicylic acid, etc., and have the stomach secretions dissolve it; these substances are all readily soluble, though in the compressed tablet they dissolve slowly, and hence when taken whole they give a concentrated local action at some one point, and are liable to irritate the stomach. These remarks apply with greater force to the many tablets containing substances of difficult solubility.

After rendering more palatable the preparations of the old remedies, the chemists took a big step forward when by improved processes they extracted the alkaloids from a number of crude drugs, and then, through the aid of machinery, reduced the price of manufacture so as to remove them from the list of scientific curiosities to that of commercial products, and as a consequence to-day morphia has to a great extent supplanted laudanum, extract of opium, etc., quinine has entirely displaced cinchona bark, and so on; others might be mentioned. In fact, so many alkaloids have been extracted, and the use of the hypodermic syringe has become so common, some physicians are advocating the alkaloidal treatment of diseases.

There is no questioning the fact that the alkaloids are of great value, and that their introduction marked a great advance in medicine; at the same time it is well to pause and consider if it is best to entirely abandon the use of the crude drug. Morphia in certain emergencies is invaluable, and it would be difficult to dispense with the use of it, but to use it entirely to the exclusion of opium with its many alkaloids and other principles, all harmoniously blended by nature to do a peculiar, particular and positive work, is questionable. The same may be said of quinine, which to a certain extent acts as a specific in malarial affections, but does not give the thorough and positive action as the preparations of cinchona bark, with its number of appropriately combined alkaloids.

The nearer we use our remedies in the original combinations, as prepared by nature, the more marked and positive, as a rule, is their efficiency. Take salicylic acid for an illustration. The synthetical, artificially prepared acid is not as efficient in the treatment of rheumatism as the natural acid extracted from the oil of gaultheria, and, as far as my own experience goes, the natural acid is not as efficient as the oil of gaultheria where the acid is present, as prepared in nature's laboratory. It must be admitted that the crude drug is often not as well borne by the stomach, but a temporary disturbing of the stomach is a matter of slight consideration when compared to the more rapidly cutting short of a diseased condition.

This attempt to supplant the crude drug by its principal alkaloid brings us to the first signs of breaking away from the traditions of the past, and the obliteration of the landmarks of therapeutics established by many generations of shrewd and closely observing physicians—men who worked steadily, and patiently noted the ac-

tion of the drugs at their disposal, before the days of so many fads to take up their time, and cause them to jump from one new remedy to another at such a rate as to render it impossible to obtain from experience any facts of value to note.

The chemists, not content with working upon the old remedies, have of recent years made another great scientific advance. By bringing synthetical chemistry to bear upon coal tar, they have produced a number of artificial substances which under euphonious trade and tongue-twisting chemical names are launched upon the experimenting physicians as medicinal to be used for the benefit or injury of suffering humanity. So numerous are these substances already, and so rapidly are they increasing in number, it is more than a physician can do to learn and remember their easy names, to say nothing about obtaining any definite knowledge of their actions and uses, even if such information existed, or he had the time and inclination to experiment upon his patients.

The introduction of these synthetical substances as therapeutic agents brings us to the second break from the traditions of the past, and still further tends to obliterate the landmarks of the older therapeutics.

SERUM THERAPY.

Improvements in the microscope advanced the study of histology, and following this pathology began to look up and make rapid strides forward, and, as a natural sequence, bacteriology, with its hunt for the micro-organisms of disease, entered the field as a special study. The bacteriologist, having discovered and captured the microbes of several diseases, immediately entered upon the search for the remdies to shoot at his small animals, and as a result serum therapy starts upon its course of development.

This brings us to the third and last break, and, according to the progenitors and followers of serum therapy, the old therapeutics is doomed to oblivion.

We now come to a question of vital importance to both physician and patient: Are we acting in the best interests of our patients when we break away from the accumulated knowledge of ages, as shown in the therapeutical application of these old remedies, the actions of which were worked out upon the diseased human being, and instead, take up these new remedies of which we know but little, and the therapeutical indications for which have been deduced from laboratory experiments from healthy lower animals?

It must be admitted that the therapeutics of the old drugs is the

result almost entirely of empiricism, that is, "they were used with little knowledge of their action, as a rule, but giving successful results in certain cases, they were administered again in similar cases." Hence, it was at the bedside that a practical knowledge of their actions was obtained, and it is this classified and crucially tested knowledge of many painstaking and keen observers for many years that we draw from to-day, and have added to but little with all our experimenting.

Empirical therapeutics is now looked upon with great disfavor, and the term empiricism is almost a word of reproach. Rational therapeutics has theoretically displaced empirical therapeutics, and the term rationalism that of empiricism. A new study comes in here, that of pharmacology,which is the "knowledge of the mode of action of drugs upon the body generally, and upon its various parts." And this knowledge is obtained by watching the effects produced in the laboratory by a medicine on dogs, cats, guinea-pigs or frogs. Now we can get at an understanding of rational therapeutics. It consists in "the administration of a drug because we know the pathological conditions occurring in disease, and know also the pharmacological action of the drug is such as to render it possible that it will remove or counteract these conditions."

The action of a drug upon a healthy subject can hardly be the same as upon a diseased individual, nor can we admit that the action upon a lower animal will be the same as upon a human being. So when we use a remedy simply upon the endorsement of rational therapeutics, we are taking its action in a healthy lower animal and reasoning from this, applying it to a supposed known diseased condition in the higher animal, man; it may work as expected, and it may not. In other words, we are trying the drug, and apt as not will get an action differing from the one deduced, still an action to be noted, and possibly made use of in some other diseased condition. This virtually lands us back into empiricism. Map out the rational therapeutics of a drug as you may, it must stand the test of experience at the bedside, and in the hands of careful observers this means what may be called a rational empiricism.

When the pharmacology of a drug is determined by experiments on a healthy, frightened carnivorous cat, or gramnivorous guinea-pig, or cold-blooded frog, animals that cannot express or show their exact feelings, and are not swayed by thought and emotion,

it does not seem just to deduce therapeutical indications for the drug, and proceed to apply it to the diseased omnivorous animal, man. Why not select the omnivorous hog, which of all animals resembles man the most in many respects, and work out the pharmacology of a drug instead of taking animals which must of necescity have very different physiological actions going on in their systems, owing to the difference in their food supply, if for no other reason?

A very good example as to the value of experiment, compared to experience, is afforded by the old mercurial purgatives, calomel and blue-mass. Many experiments have been performed with these remedies to determine their cholagogue action, and a great deal has been written upon the subject. So far as experiments are concerned they appear useless as cholagogues, still physicians who deign to use them find that in a certain class of cases they get a desired result, and one opposed to the experimental.

The following quotations from H. C. Wood, an experimenter and a practitioner, sum up the subject quite pointedly. After detailing the results from a number of experimenters upon the cholagogue action of various remedies, including the mercurials, he writes as follows: "What is to be drawn from these various facts? Evidently, I think, but one conclusion—that the experimental evidence at present does not warrant positive deductions as to the effect of purgatives upon the biliary secretions of healthy dogs. The canine diet and digestion are so different from the human being that it is to be expected that medicines acting upon the digestive apparatus will influence dogs differently from man; thus, I have given doses of elaterium that would have killed a man to some of the carnivora without causing the slightest purging. In view of these facts, the only fairly deducible conclusion in regard to the experimental evidence that has been brought forward is, that it must be received with the greatest reserve, or be entirely laid aside, when we desire to study the question as to the cholagogue action of remedies upon man, and that our conclusions are most safely based upon clinical evidence." Again, in speaking of mercurials, he says: "The chief interest in the purgative action of mercurials centers in the question as to their influence upon the liver. The evidence at present derivable from experiments upon lower animals, has already been discussed, and the decision arrived at that it must be rejected."

So much for the experimental side of the subject, as stated by this noted authority, and we will now see what the evidence from experience teaches us.

The same author tells us that a "mercurial purge is especially indicated by the congeries of symptoms known as biliousness, a heavy-coated tongue, bitter, disagreeable taste, heavy headache, depression of spirits, loss of appetite, slight nausea and light-colored passages. It should be borne in mind that one or several of these symptoms may be absent in any individual case. Of all single symptoms for the use of calomel, the occurrence of potter's clay colored passages is the most important, and if such stools exist, and do not depend upon organic cause, repeated small doses of mercurial should be given, whether there be constipation or diarrhoea."

"In bilious fever, i. e., malarial fever with congestion of the liver, a mercurial purge, or several mild mercurial purges, will often, by exciting the action of the hepatic gland, be of great service in preparing the way for, or aiding in the action of quinine."

"In catarrhal jaundice, mercurials, on the whole, offer, I think, the most frequently successful mode of treatment."

The results from experimenting with strychnia are interesting in this connection. Dr. Wood says: "Strychnia acts in the same way upon all animals. According to Leube, however, it takes ten times as much to kill chickens as it does to kill other birds, weight for weight; and among mammals the guinea-pig is very insensible to it. It has also recently been asserted that on some monkeys it has very little influence."

Now, the query arises as to which animal should be taken from which to calculate the dose of strychnia for man. Without the dosage as known from nux vomica, and starting *de novo* with strychnia, the results of experiments would indicate a fatal dose for human beings, but this is liable to be the case with many other remedies.

The therapeutical indications of these synthetical substances, serums, etc., are almost entirely deduced from laboratory experiments, and then they are placed into the waiting hands of the advanced, scientific physicians, who proceed to experiment with their patients, and rush into print with their favorable results. It seems rather strange that the first reports on all of these new drugs and serums are entirely favorable, and that they are pronounced harmless, if of no value. As time passes, the careful, ordinary,

conservative, general practitioner gives his experience, and accordingly these substances find their proper place as therapeutic agents.

As physicians, we must know the action of a remedy on man, and especially in the various diseased conditions to which he is liable. It was on this ground that former observers worked out their results, and, peculiar to say, none of these old drugs are spoken of as harmless, if of no value. They are all recognized as potent for good when rightly used, and powerful for harm when wrongly used; and the pros and cons are minutely and fully stated.

Before passing to another head, it is but proper to mention an entering wedge tending toward changes in the manufacture of the old preparations. A number of tinctures that were formerly made of alcohol are now, according to the revised Pharmacoepia, made of equal parts of alcohol and water. It may be possible to give from alcohol and water a tincture having the same therapeutical action as the alcoholic tincture, but it is not at all probable, especially when dealing with such a complicated substance as opium, and as we have been accustomed to handling these alcoholic tinctures, it would be well to stop tampering with them, since the only reason for the change seems to be one of dollars and cents to the pharmacists. Distilled water at about five cents per gallon is much cheaper than alcohol at two dollars or more per gallon, hence save money by using more water in the manufacture, and let the already overtaxed physician find out in his practice if there is any difference in the action of the two tinctures, and then revise his therapeutics accordingly.

BABY FEEDING.

A very difficult problem for the general practitioner to contend with in comparatively recent years is that of baby feeding, due in part to the fact that mothers either cannot or will not nurse their babies, and also to the fact that in this time of feeding cows on swill and brewers' grain, it is difficult to get good cow's milk, the next best food to mother's milk. The commercial chemist has taken advantage of the situation, and is placing upon the market a number of preparations classed as "infant foods." At first these foods were brought to the physician's notice to be prescribed and used under their directions, and when used judiciously have often proved of value, but it was not very long before the manufacturers realized that a gold mine might be in sight, and then their foods were brought prominently and persistently to the notice of moth-

ers, and were placed in the hands of the family grocer, and as a result they are fed to infants without advice, judgment or foresight. The scare about tuberculosis in cattle and the cost of good cow's milk is in part the cause of this popularity of proprietary infant foods, but the main cause is the ingenuity displayed by the advertising artist.

We often meet with the bad results due to this indiscriminate feeding of infants with artificial food, and the cases are becoming more and more frequent. The following quotation from Thompson's "Practical Dietetics" concisely sums up the subject: "Very young infants fed upon 'proprietary' or 'prepared' baby foods, to the greater or less exclusion of mother's or good cow's milk, soon become rachitic or scrofulous. Wiederhofer says that the numerous infant foods, although much bepuffed, are of no value whatever. This is certainly true of the non-malted amylacous foods. The common fault of nearly all such preparations is that they contain too much sugar or starch, and too little fat—which latter is very difficult to preserve without becoming rancid. Two extreme conditions are seen in such infants—those who are emaciated and marasmic, and those who are stout and apparently robust, but whose strength and power of resistance to disease are very deceptive."

A brief mention will be made of several important changes in the dietetics of adult and childhood life.

Oatmeal, a very hearty food, one adapted to the strong digestion of a vigorous outdoor life, has taken an affectionate hold upon the popular fancy, and is largely consumed by children and brain workers of weak digestion, who take but little exercise and pass their lives mostly indoors. Wheat and corn are made into flour by processes that are rapid and entirely new, but calculated to give the largest output to the miller. Dressed meats are transported hundreds and thousands of miles in refrigerator cars and vessels, to be consumed days after the killing of the animal. Green vegetables are carried in great quantities long distances from climates where the season is months in advance of that in which the consumer dwells. Vegetables contain a large amount of water in loose, physiological combination, and weight for weight but little nourishment. To easily digest they must be fresh and succulent, and when taken from the ground the process of evaporation soon removes enough water to render them stale, tough and difficult of digestion. Such vegetables are not conducive to good health in

season, and to eat them out of season in a climate calling for a good, nutritious diet, not a mere filling up with material that is almost entirely waste, is pushing the elasticity of nature a little too far. Tropical fruits are brought thousands of miles to ripen, and are so abundant and cheap as to be consumed by rich and poor the year round.

Such changes in diet must produce some effect in the animal body, and give a somewhat different pabulum for the micro-organisms of disease to work upon, and hence produce changes in the types of diseases different from those described by the older authors.

IMPROVED CULTURE.

Perhaps the greatest change in the last thirty years has been within the profession itself. Medical colleges have sprung up and multiplied like mushrooms, and while many of them are not what they should be, having been organized simply as money-making institutions for the benefit of the pockets of those connected with them, the majority of the colleges are doing good work, especially the older ones situated in the large medical centers. A number of colleges have opened their doors to the fair sex, and now we have the ladies with us in the profession, and they are showing us that women can do what was considered in the past to be a man's work. God bless them!

There can be no doubt of the fact that in general the graduate physician of this day is far better equipped theoretically than was ever known in the history of the profession, and he has also a certain amount of practical experience gained from observation under the guidance of others, but not that experience which is only obtained by being thrown upon his own resources in private work. Many of these graduates, after a pleasant year in Europe, or a little extra study at home, seek the royal part of practice, by starting out immediately as specialists in one of the many fields in which medicine is minutely divided at this time. The increase in the number of specialists has been more than rapid, and in cities they are almost as numerous as the general practitioners. It is here we note a great contrast, for there were but few specialists thirty years ago, and they were men who had practiced medicine for some years, and from natural ability, or force of confidence coming from their brother physicians, had gradually limited their labor to one of the few subjects looked upon as special fields of work. These men were equipped all around, they had served a full apprenticeship,

and could examine their cases through the eyes of a general practitioner, noting all that bore upon the special disease, and then, bringing special knowledge to bear, would give advice of value. It has seemed that the days of the general physician were numbered and of short duration; that they must become nothing but mere feeders for the specialists; and in the medical journals more or less uneasiness is expressed about the passing of the general practitioner. Fortunately, the people, those who should be uneasy, have taken the alarm, and the palmy days of specialists are on the wane, and unless the specialists build a firmer foundation to support the top-heavy superstructure they have reared, they will have to call upon the general practitioner in order to treat intelligently their cases.

We read a great deal about the great advances in the science of modern medicine, and this seems to be a favorite topic with the many purely journal physicians, who are continually ventilating their ideas in the pages of the almost numberless advertising medical journals which exist, but do not flourish. The study of medicine may be a science, in that it is the study of classified knowledge, but it is indeed a question whether the practice of medicine is any more of a science to-day, or will be any more of a science in the future, than it has been in the past. When this classified knowledge comes to be applied, it is found that no two subjects are alike except in generalities, that no disease gives exactly the same symptoms or runs the same course in any two subjects, or even in the same subject when affecting it twice; and again, a disease will act differently in different seasons of the year and in different epidemics. A remedy does not always give the same action upon any two individuals, nor upon one individual at different times. No two physicians, equally learned in this classified knowledge, will apply it in handling a disease in the same manner, and with the same symptoms before them they will often not agree even as to the disease. With such variations in the practical application of medical knowledge, it is not surprising that the many formulated treatments that burden the journals should prove failures, and it does not seem correct to speak of the practice of medicine as a science, or expect that it can ever be such.

PREVENTIVE MEDICINE.

There is one department of practical medicine that is a science, pure and simple, where definite results follow the application of definite knowledge, that of Preventive Medicine, and this has made

the greatest advance of any in the present generation, although it is about the oldest, going back even to the time of Moses.

Some may claim that surgery bears the palm, for forging ahead to the accomplishment of results that border upon the marvelous. Our surgeons are doing great work, still they are no more skillful in the use of the knife, if as skillful, as those of the past. Considering the difficulties the surgeons of the past had to contend against, the operations they devised and performed showed a boldness and skill ahead of the present day. The surgeons of this day proceed with but little hesitation to perform operations that would have resulted formerly in death, not because of any superior skill, but because they have confidence that septic poisoning, the dread of surgeons in all times, will not step in and destroy their work, and this confidence has been brought about by the advances made in preventive medicine.

Starting with Lister's antiseptic method and following surgery down to the present, through all of the substances used as germ-killers, and the ideas for applying them, we come finally to the present efforts for absolute cleanliness, not only of the instruments and surroundings, but also in the person of the operator, assistant and patient. Germ-killing solutions are abandoned for water freed from germs by distillation or boiling, and dressings cleansed from germs by heat have taken the place of gauze impregnated with germicides. Life only can produce life; living germs must be present to produce germs; hence, keep away germs from the wound and sepsis cannot follow. This is what the surgeon means by asepsis, and the results obtained are wonderful illustrations of the value of the science of preventive medicine, a science that has been developed by the physicians of the past and the present. Applying the results of this work of the physicians, the surgeons have been enabled to mount the pinnacle which they now occupy with such self-satisfaction and pride.

This branch of practical medicine is based upon demonstrable scientific principles, and calls into action the skill of the chemist, the physicist, the pathologist, the physiologist and the bacteriologist, and it is from this that the greatest advances in the future are to be expected. Pure air, pure water and pure food will work wonders, but to get these and fully apply teachings of hygiene, will require the concerted action of the national, State and city governments, giving authority and the means with which to work.

In conclusion I will say that it is not my intention to belittle in

any way the experimental work tending to advance medicine. I simply wish to impress the idea that in this period of shaking our own hands in congratulation at living in a time of such advanced and enlightened thought, and being freed from what we style the ignorance and superstition of the past, we must remember that what has been accomplished in recent years was foreshadowed by the thinkers and workers who have gone, and that they thoroughly established the groundwork upon which we are building. We must not forget that without the pure sciences of chemistry and physics to aid, we could have done but little, and that great credit is due to the skilled mechanic who under the guidance of the scientist has so perfected and cheapened the instruments of precision as to place them within the means of the many instead of the few, especially the microscope, the great engine of modern medical advance.

Furthermore, while we have more to work with, we have more to contend against, and it behooves us, who practically apply the many new theories, and handle the new remedies, to move carefully and not jump at conclusions of our own, nor too readily accept the snap-shot conclusions of others; that we should not allow the cupidity of any one for fame or money to influence us to give up the old and well-known for the new and comparatively unknown.

THAT PROVERBIAL CURE.—Belief in the curative powers of "a hair from the tail of the dog that bit you" is not yet extinct, and the proof of that fact came this week to the doctors in charge of the St. Louis City Hospital. Under their charge is a little German boy who is recovering from injuries inflicted some weeks ago by a dog whose ferocity was the result of the animal's disposition and not of hydrophobia. The child's mother was not satisfied with the treatment he was receiving, and she appeared at the hospital with a little bundle, which, after many wrappings had been removed, was found to contain a few yellow bristles about half an inch long. "I had some cure," she said very gravely. "My neighbors they tell me of him, and all says if I vill put some hairs from the end of her tail von der dog what bit mine kind, he vill pe sure get vell. So I goes to der man vat has das dog, und er gives me de hairs, und I haf bring dem, und vill safe mine kind." The doctors attempted to explain that this phase of homeopathy was somewhat out of date, but the woman's faith in the remedy was so strong, and her distress at its being discredited was so great, that they were forced to promise that her wishes should be carried out.

TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF MICHIGAN.

By A. N. Bell.

Michigan lies between 41° 42′ and 47° 32′ north latitude, the meridans of 82° 24′ and 90° 31′ west longitude from Greenwich, and occupies an area of 78,915 sq. miles, of which 1,485 sq. miles are water surface.

It consists of two peninsulas, of which the lower, resting on Ohio and Indiana, and bounded on all other sides by the lakes and their connecting waters, extends 300 miles northward, with an average breadth of 200 miles; while the upper, resting with its southwest border on Wisconsin, extends eastward between the lakes to St. Mary's River, the outlet of Lake Superior, with a length of over 300 miles and an average width of about fifty-five miles.

The physical features indicate that during the glacial epoch the whole of Michigan was buried beneath several thousand feet of ice, which flowed in a southerly direction and greatly modified the previous topography.

In the lower peninsula, where the rocks, eroded by glacial action, lie deeply buried, the relief of the land as now seen, is almost wholly the result of the deposition of clay, gravel, sand and boulders by glaciers, and by the streams flowing beneath the ancient ice-sheet, or issuing from its margin.

Imperfect drainage has left thousands of lakes filling depressions in the surface, while thousands more of shallow lakes have been filled with marl and peat, and now form swamps, or have been drained and furnish rich soils covered with luxuriant vegetation.

Over considerable areas there are no surface streams, the rainfall being conducted away by percolation. Beneath the general covering of glacial deposits there is a system of stream channels, excavated in hard rock, traces of which are in some places recognized on the surface, or discovered by wells and borings, but with no immediate relation to the present surface drainage.

In the lower peninsula there are several elevations of from 100 to 700 feet above the lakes, but these are seldom abrupt and are scarcely distinguishable in the generally monotonous topography. Through the central portion of the peninsula, from Saginaw, south-

westerly, there is a broad, low tract of country, which would be transformed into a strait, leaving the country to the north as an island, should the waters of Lakes Michigan and Huron be raised seventy-five feet. A high-water stage of the great lakes, which came later than the glaciers, left beaches at elevations of several hundred feet above the present lake surfaces, and spread fine clays over the submerged borders.

These ancient lake ridges are easily recognizable in both the lower and upper peninsulas. On Lake Michigan shore of the lower peninsula are large tracts of drifting-sand forming dunes, which travel inland in the direction of the prevailing winds.

The extent of the lake coast of Michigan is very great, exceeding 1,100 miles, including numerous bays and excellent harbors. Besides the four great lakes, Superior, Michigan, Huron and Erie, and the smaller one, St. Clair, which form so large a part of the lower basis of the State, there are hundreds of small lakes, which contribute to the beauty of the scenery, although they may not count among the navigable waters of the State; the larger share of them is in the northern peninsula, though the southern has a considerable number. The northern peninsula has Keweenow Bay, Marquette Harbor, Tequamenon Bay, the bays and inlets around St. Mary's River; and on its southern shore, Mackinaw Bay and Strait, the Big and Little Bays de Noquet, and the long and deep Green Bay. The lower peninsula has on the Lake Huron side, Thunder Bay, Saginaw and the fine and sheltered roadsteads of Port Huron, the St. Clair and Detroit rivers, and Lake St. Clair; and on Lake Erie, Monroe harbor. On the west, or Lake Michigan side, are several artificial harbors, such as New Buffalo, South Haven, Grand Haven, and Luddington, all more or less exposed to westerly winds: and farther north, Grand Traverse and Little Traverse bays, which are excellent and well sheltered harbors.

The southern portion of the lower peninsula, now the garden and orchard of the Northwest, formerly encumbered with swamps, worthless and unhealthful, is now for the most part drained, cultivated and healthful.

The principal rivers of the State are in the upper peninsula—the Ontonagon, Tequamenon, Escanaba, White Fish, Michigaunne and Manistique rivers; in the lower peninsula—the Cheboygan, Thunder Bay, Au Sable, and Saginaw, discharging into Lake Huron; Racine River, into Lake Erie; Grand Kalamazoo,

St. Joseph, Muskegon, and Manistee, into Lake Michigan; the so-called Detroit and St. Clair rivers, are only straits connecting the lakes with each other.

The islands are very numerous, and some of them delightful and healthful resorts. The principal are: Isle Royale and its dependent islands in Lake Superior, which form a county of the State; the Beaver, Fox, and Manitou isles, are in the northern part of Lake Michigan; Bois Blanc and Mackinac islands in the Mackinaw straits. Drummond Island in Lake Huron and the Sugar Islands in the Straits of St. Mary. Some of these islands and several places on the lake shores are remarkable for the beauty of the scenery and improved advantages as summer resorts for tourists and invalids.

Petoskey, once the site of the largest Indian village in the State, built on the succession of natural terraces rising from the beach of Little Traverse Bay, is near the centre of what may be called the resort region of Michigan. Its location is at once commanding and beautiful. The cool, invigorating breezes from Lake Michigan and Little Traverse Bay, its pure water and the absence of malarial shores make it a natural sanitarium. Radiating from it in nearly all directions, railroad and steamboat lines lead to the various surrounding resorts, fishing and bathing grounds. The Harbor Springs branch of the Grand Rapids & Indiana Railway, built near the shore and in some places on the beach of Little Traverse Bay, puts Petoskey in close touch and pleasant communication with all points on the bay. During the summer season a suburban train service is maintained between Petoskey and Bay View, Roaring Brook, Wequetonsing, Harbor Springs, Harbor Point, Oden-Oden and Bear Lake, and commutation tickets at cheap rates are sold, enabling visitors to reach these points with great convenience and slight expense. There are many good hotels and pleasant boarding houses and visitors are certain of accommodations suitable to their taste and purse. The principal hotels are the Arlington, Imperial, Cushman, Occidental, Clifton and National.

Mackinac Island, situated in the Mackinaw Straits, is reputed to be the coolest and, since its great improvement and supervision as a State Park, one of the cleanest and most healthful summer resorts in the country. Unlike the climate common to the seaside, the atmosphere of Mackinac Island is said to be crisp—though we have no record to this effect—and invigorating, and an admirable tonic. It is above all, commendable to the victims of hay fever

and all such ills as are more or less due to dust in the air, of which the atmosphere is almost wholly devoid. The island is covered with a dense growth of beech, birch, maple and arbor vitae and the hard, smooth roads, winding gracefully about to the different points of interest, make riding, driving or wheeling a great pleasure. The many points which well repay a visit have been often described are: Arch Rock, a natural bridge of rocks on the northern cliffs; Fort Holmes, the remains of the old British fort; Sugar Loaf, a huge rock, the shape suggesting the name; the panorama of the commerce passing through the straits. Among other hotels are the Astor, Island, New Mackinac, Mission, New Murray, Palmer and New Chicago. The Island Transportation Co.'s steamers connect at Mackinaw City with all Grand Rapids & Indiana Railway trains.

Les Cheneaux Islands, about one hundred in number, fourteen miles distant from Mackinac Island, near the shore of Lake Huron, are noted for the fine fishing afforded. Around the rocky points are black bass and along the edges of the green rushes large yellow perch feed, while in the deep water channels pike and muskalonge are found. The islands being so close together form a perfect shelter from heavy winds and permit all kinds of boating with safety. All necessaries for fishing can be procured at the hotels, Elliot, Les Cheneaux, Bethel and Islington. The Les Cheneaux Club has a home-like club house on Marquette, the largest of the islands. The islands are reached by a double daily line of boats from Mackinac Island.

Cheboygan is one of the most restful and beautiful summer day's rides to be found anywhere, and one of the most delightful excursions in Northern Michigan is the trip from Petoskey to Cheboygan via the Inland Route Company's steamers, which make daily trips during the season. Taking the Grand Rapids & Indiana Railway to Oden-Oden, thence by one of the little steamers through Crooked Lake, Crooked River, Burt Lake, Indian River, Mullet Lake and Cheboygan River to Point aux Pins, a beautiful cottage resort on the south side of Bois Blanc Island opposite Cheboygan. "The Pines" Hotel furnishes choice accommodations for guests at reasonable terms. The lakes and rivers of the "Inland Route" furnish excellent camping grounds and the best facilities for fishing.

Charlevoix, a town of over 2,000 inhabitants, with excellent accommodations, eighteen miles southwest of Petoskey, on the sandy

shore of Lake Michigan, has long been a favorite resort for Chicagoans. Pine Lake, with three miles of sandy beach, at the eastern boundary of the city, has for its outlet into Lake Michigan, Pine River, which broadens into Round Lake about midway between the two larger lakes. Here on the terraced shores of the river and lakes are located many beautiful villas and hotels.

These resorts have all the attractions which pure air, good hotels and pleasant surroundings can give them. Pine Lake, extending eastward over ten miles, is a beautiful sheet of water and one of the finest inland lakes in Michigan. Adequate train and steamer service is provided between Petoskey and Charlevoix.

Moreover, the inland route—from Charlevoix to Traverse City, at the head of Grand Traverse Bay—sixty-five miles via the Chicago & West Michigan Railway, is a virtual land navigation through a region of beautiful lakelets, foaming streams and minature cataracts, abounding with fish; convenient stopping places with good accommodations and all the paraphernalia requisite for the promotion of health and pleasure of the tourist, or for an all summer's recreation.

THE CLIMATE, upon the whole, may be characterized as intermediate—between that of the relatively moist New England and that of the relatively dry Dakotas. It also has some features peculiar to its position. In the spring the great lakes, the waters of which warm up more slowly than the land, serve to hold back the summer temperatures. Hence spring comes late and with a rush, its actual duration being extremely short—sometimes not more than a fortnight.

May Day in Michigan is almost invariably cold and raw. In the autumn, the lakes, whose waters cool slowly, prolong the autumn and give several weeks of cool, stimulating and beautiful weather, which may extend well into December.

Moreover, the extremes of temperature are cut down at both ends, so that the weather is not generally either so cold in winter or so hot in summer as it is in adjacent States.

The number of storms that pass over the State in the course of a year is large. If maps were drawn for a number of years, showing in black the path of each storm, the successive maps would become blacker and blacker, and the blackest would be in the vicinity of Alpena. But, more particularly, with regard to the relation of the meteorological conditions to health, reference should be made to their annual summary—indeed the monthly, of which the annual

report is a condensation—of the State Board of Health, which stands foremost among the State Boards of Health in the United States, in showing the differential relations of climate to health, based upon the records of competent observers well distributed throughout the State. These records are not only pertinent to the particular year summarized in these reports from year to year, but they are so combined and compared with previous records as to constitute a record of continuously increasing value from which practical conclusions may be deduced with regard to the influence of climate on health generally, besides being the best possible basis of climatic prognostication for the climate of Michigan in particular. The State Board of Health Report (1891) for 1890, is an example. It gives tabulated statistics of the average temperature by years and months for each of the years, 1877-'90; 1879-'90, and 1864-'90. Also tables of other meteorological observations in months for the year 1890, compared with averages for corresponding months in preceding years. And elucidates as follows:

"At the several meteorological stations, in different parts of the State, the average temperature for 1890 was 97° higher than the average for the preceding thirteen years; the annual range of temperature was 6° greater than in 1889, and the same as the annual average range for the preceding thirteen years; the average monthly range of temperature was 5° greater than in 1889 and the same as the average for the preceding thirteen years; the average daily range of temperature .08° less than in 1889 and .77° less than the average for the preceding eleven years. The average cloudiness was the same as the average for the preceding thirteen years. The rainfall (and melted snow) was 2.02 inches greater than in 1889 and 5.13 inches less than the average for the preceding thirteen years. The average atmospheric pressure was .002 of an inch less than in 1889 and .034 of an inch less than the average for the preceding thirteen years."

THE MINERAL WATERS of the State, as reported upon by Dr. Albert C. Peale (Bul. U. S. Geological Survey), are derived, for the most part, from wells, artesian and other wells, sunk originally for other purposes than to find mineral waters, but now commonly designated *mineral springs*. The artesian borings however, are in the carboniferous limestone and the Huron group (Devonian), And of this, Prof. Alexander Winchell says: "The conformation of the strata has retained all of their original soluble constituents; hence all artesian waters in the State, save some outlying leached-

out patches of the Parma sandstone, will be found to be mineralized."

The saline waters greatly predominate, insomuch that those which are excessively so, are known as *brines.* These are used exclusively for the production of salt, one of the most important industries of the State, wholly apart from *medicinal* mineral waters, and therefore omitted from our summary. The list which follows is compiled from the State geological reports, State Board of Health report (1877), and sundry monographs and advertisements.

The analyzed mineral springs are as follows:

Fruitport Artesian and Magnetic Well, Fruitport, Muskegon County. C. J. Wheeler, analyst.

Saline.

Sodium bicarbonate	grains	per gallon	6.52
Calcium bicarbonate	"	"	5.11
Magnesium bicarbonate	"	"	4.15
Iron bicarbonate	"	"	7.50
Manganese bicarbonate	"	"	0.10
Sodium sulphate	"	"	46.00
Sodium chloride	"	"	464.03
Potassium chloride	"	"	0.43
Calcium chloride	"	"	111.11
Magnesium chloride	"	"	46.81
Bromide	"	"	0.77
Alumina	"	"	Trace
Silica	"	"	10.60
Total			703.13
Carbonic acid	cubic inches.		7.

Alpena Magnetic Well, Alpena, Alpena County. S. P. Duffield, analyst.

Saline-sulphuretted.

Sodium bicarbonate	gains	per gallon.	15.74
Calcium bicarbonate	"	"	55.14
Magnesium bicarbonate	"	"	62.92
Iron bicarbonate	"	"	1.89
Calcium sulphate	"	"	30.06
Sodium chloride	"	"	68.25
Silica	"	"	3.09
Organic matter and loss	"	"	0.92
Total			237.96

Carbonic acid	cubic inches.		8.40
Sulphuretted hydrogen	"	"	35.36
Nitrogen	"	"	0.24

Eaton Rapids Magnetic Springs and Well, Eaton Rapids, Eaton County.

Bodine Spring, R. C. Kedzie, analyst.

Alkaline.

Sodium bicarbonate	grains per gallon.		5.05
Potassium bicarbonate	"	"	3.00
Calcium bicarbonate	"	"	40.47
Magnesium bicarbonate	"	"	8.40
Iron bicarbonate	"	"	2.25
Calcium sulphate	"	"	57.50
Sodium chloride	"	"	1.50
Silica	"	"	2.00
Total			120.17
Carbonic acid	cubic inches		17.35

Frost Well. S. P. Duffield, analyst.

Calcareous saline.

Calcium carbonate	grains per gallon.		46.24
Magnesium corbonate	"	"	9.11
Iron carbonate	"	"	2.38
Calcium sulphate	"	"	4.64
Sodium chloride	"	"	9.21
Silica	"	"	15.74
Organic matter and loss	"	"	0.90
Total			88.22
Carbonic acid	cubic inches.		22.22

Mosher Spring. R. C. Kedzie, analyst.

Calcareous.

Sodium carbonate	grains per gallon.		5.38
Potassium carbonate	"	"	1.15
Calcium carbonate	"	"	19.43
Magnesium carbonate	"	"	4.52
Iron bicarbonate	"	"	1.00
Calcium sulphate	"	"	45.16
Sodium chloride	"	"	0.90
Silica	"	"	2.54
Organic matter and loss	"	"	0.85
Total			80.93
Carbonic acid	cubic inches.		15.38

Shaw Spring. R. C. Kedzie, analyst.

Calcareous.

Sodium carbonate	grains	per gallon.	11.57
Potassium carbonate	"	"	1.27
Calcium carbonate	"	"	20.74
Magnesium carbonate	"	"	3.84
Iron bicarbonate	"	"	2.23
Calcium sulphate	"	"	48.13
Sodium chloride	"	"	0.90
Silica	"	"	1.40
Organic matter and loss	"	"	0.90
Total			90.98
Carbonic acid	cubic	inches.	15.97

Sterling Spring. C. T. Jackson, analyst.

Calcareous.

Iron carbonate	grains	per gallon.	2.80
Sodium sulphate	"	"	12.59
Calcium sulphate	"	"	55.20
Magnesium sulphate	"	"	9.40
Sodium chloride with sodium carb	"	"	5.21
Total			85.20

Butterworth's Magnetic Spring, Grand Rapids, Kent County. S. P. Duffield, analyst.

Calcareous-saline.

Sodium bicarbonate	grains	per gallon.	6.00
Calcium bicarbonate	"	"	10.01
Magnesium bicarbonate	"	"	7.02
Iron bicarbonate	"	"	1.17
Calcium sulphate	"	"	90.19
Sodium chloride	"	"	15.28
Potassium chloride	"	"	11.79
Calcium chloride	"	"	7.33
Magnesium chloride	"	"	50.24
Alumina	"	"	0.49
Silica	"	"	0.62
Organic matter and loss	"	"	0.80
Total			200.94

Riverside Magnetic Mineral Springs, Springwell's Fort, near Detroit, Wayne County.

Spring, No. 1.

Calcareous-sulphuretted.

Calcium carbonate	grains	per gallon.	16.40
Calcium sulphate	"	"	114.42
Magnesium sulphate	"	"	44.32
Sodium chloride	"	"	31.79
Magnesium chloride	"	"	25.96
Silica	"	"	Trace
Total			232.89
Sulphuretted hydrogen	cubic	inches.	19.2

Spring No. 2.

Saline-sulphurous.

Sodium carbonate	grains	per gallon.	2.80
calcium carbonate	"	"	11.15
Calcium bicarbonate	"	"	0.22
Iron carbonate	"	"	0.10
Calcium sulphate	"	"	160.77
Sodium chloride	"	"	310.55
Calcium chloride	"	"	42.58
Magnesium chloride	"	"	109.77
Alumina	"	"	0.51
Silica	"	"	0.21
Total			638.66
Sulphuretted hydrogen	cubic	inches.	14.77

Lansing Magnetic Well, Lansing, Ingham County. Dr. Jennings, analyst.

Alkaline.

Sodium bicarbonate	grains	per gallon.	112.08
Calcium bicarbonate	"	"	107.59
Magnesium bicarbonate	"	"	23.03
Iron bicarbonate	"	"	1.88
Sodium sulphate	"	"	30.06
Potassium sulphate	"	"	14.94
Sodium chloride	"	"	320.22
Silica	"	"	3.97
Total			613.77
Carbonic acid gas	cubic	inches.	235.55

Grand Haven Mineral Spring, Grand Haven, Ottawa County. C. G. Wheeler, analyst.

Saline.

Sodium carbonate	grains	per gallon.	2.09
Potassium carbonate	"	"	2.74
Calcium carbonate	"	"	2.01
Magnesium carbonate	"	"	1.52
Iron carbonate	"	"	0.08
Sodium sulphate	"	"	71.29
Sodium chloride	"	"	306.03
Potassium chloride	"	"	1.93
Calcium chloride	"	"	148.05
Magnesium chloride	"	"	71.53
Magnesium iodide	"	"	0.05
Magnesium bromide	"	"	0.17
Calcium fluoride	"	"	0.05
Alumina	"	"	0.30
Silica	"	"	1.05
Total			608.89

Hubbardston Magnetic Spring, Hubbardston, Ionia County. P. H. Douglass, analyst.

Calcareous.

Calcium bicarbonate	grains	per gallon.	23.81
Magnesium bicarbonate	"	"	10.71
Iron protoxide	"	"	0.16
Silica	"	"	0.14
Total			34.82

Leslie Magnetic Wells, Leslie, Ingham County. R. C. Kedzie, analyst.

Sodium bicarbonate	grains	per gallon.	5.27
Potassium bicarbonate	"	"	4.55
Calcium bicarbonate	"	"	30.62
Magnesium bicarbonate	"	"	10.53
Iron bicarbonate	"	"	2.27
Calcium sulphate	"	"	7.04
Silica	"	"	2.08
Organic matter	"	"	0.65
Total			63.01
Carbonic acid gas	cubic inches.		13.5

Midland Magnetic Well, Midland, Midland County. S. P. Duffield, analyst.

Saline.

Sodium sulphate	grains	per gallon.	22.07
Potassium sulphate	"	"	82.19
Calcium sulphate	"	"	4.46
Aluminium phosphate	"	"	1.73
Sodium chloride	"	"	32.70
Calcium chloride	"	"	6.22
Magnesium chloride	"	"	2.19
Silica	"	"	2.97
Organic matter	"	"	2.47
Loss	"	"	3.21
Total			160.21

Mount Clemens Mineral Spring, Mount Clemens, Macomb County.

Mount Clemens Mineral Well. S. P. Duffield, analyst.

Saline.

Calcium carbonate	grains	per gallon.	0.98
Magnesium carbonate	"	"	0.70
Iron carbonate	"	"	5.60
Calcium sulphate	"	"	100.56
Sodium chloride	"	"	11,900.00
Calcium chloride	"	"	934.50
Magnesium chloride	"	"	648.48
Magnesium iodide	"	"	0.07
Magnesium bromide	"	"	6.37
Alumina	"	"	29.47
Silica	"	"	27.60
Total			13,654.33
Hydrogen sulphide	cubic	inches.	40.00
Carbonic acid	"	"	5.85
Nitrogen	"	"	Present

Medea Spring. S. P. Duffield, analyst.

Calcareous.

Calcium carbonate	grains per gallon.		91 00
Magnesium carbonate	"	"	0.70
Calcium sulphate	"	"	14.30
Potassic salts	"	"	Trace
Sodic salts, magnesic salts, calcic salts	"	"	11,741.00
Iron	"	"	8.50
Alumina	"	"	29.00
Silica	"	"	28.00
Bromine	"	"	8.50
Iodine	"	"	0.07
Ammonia	"	"	Trace
Total			11,921.07
Hydrogen sulphide	cubic inches.		40.00

Soolbad Spring. S. P. Duffield, analyst.

Calcareous.

Calcium carbonate	grains per gallon.		Trace
Magnesium carbonate	"	"	Trace
Calcium sulphate	"	"	44.00
Potassic salts	"	"	Trace
Sodic salts, calcic salts, magnesic salts	"	"	11,181.00
Iron	"	"	Trace
Alumina	"	"	11.21
Bromine	"	"	Trace
Iodine	"	"	0.05
Ammonia	"	"	Trace
Total			11,236.26
Hydrogen sulphide	cubic inches		33.00

Owossa Chalybeate Spring, Owossa, Shiawassee County. ——, analyst.

Chalybeate.

Calcium bicarbonate	grains per gallon.		25.67
Magnesium bicarbonate	"	"	19.09
Iron bicarbonate	"	"	15.92
Sodium chloride, potassium chloride	"	"	2.10
Alumina, silica	"	"	0.62
Total			63.40

St. Louis Magnetic Spring, St. Louis, Gratiot County. S. P. Duffield, analyst.

Alkaline.

Sodium bicarbonate	grains	per gallon.	106.40
Calcium bicarbonate	"	"	69.40
Magnesium bicarbonate	"	"	17.50
Iron bicarbonate	"	"	1.20
Calcium sulphate	"	"	66.50
Calcium silicate	"	"	6.72
Chloride	"	"	Trace
Silica	"	"	2.88
Organic matter, loss	"	"	2.00
Total			272.60
Hydrogen sulphide			Trace
Carbonic acid	cubic	inches.	6.21

Ypsilanti Mineral Springs, Ypsilanti, Washtenaw County. Ypsilanti Well. A. B. Prescott, analyst.

Saline.

Calcium bicarbonate	grains	per gallon.	36.94
Potassium sulphate	"	"	13.62
Calcium sulphate	"	"	179.96
Magnesium sulphate	"	"	68.07
Phosphates	"	"	Trace
Borates	"	"	Trace
Lithium salts	"	"	Trace
Strontium salts	"	"	Trace
Barium salts	"	"	Trace
Ferrous salts	"	"	Trace
Sodium sulphide	"	"	12.19
Sodium chloride	"	"	832.04
Magnesium chloride	"	"	57.91
Magnesium bromide	"	"	3.56
Fluorides	"	"	Trace
Silica	"	"	1.40
Total			1,205.69
Hydrogen sulphide	cubic	inches.	21.68

Moorman Well. J. H. Shepard, analyst.

Saline.

Calcium carbonate	grains	per	gallon. 68.73
Potassium sulphate	"	"	42.40
Calcium sulphate	"	"	210.78
Magnesium sulphate	"	"	124.52
Phosphates	"	"	Trace
Borates	"	"	Trace
Lithium salts	"	"	Trace
Strontium salts	"	"	Trace
Barium salts	"	"	Trace
Ferrous salts	"	"	Trace
Sodium sulphide	"	"	10.12
Sodium chloride	"	"	1,888.35
Calcium chloride	"	"	172.04
Magnesium chloride	"	"	153.72
Magnesium bromide	"	"	13.17
Silicon dioxide	"	"	23.79
Organic matter	"	"	Trace
Total			2,707.62
Hydrogen sulphide	cubic	inches.	32.216

Owens Mineral Well. J. H. Shepard and W. F. Pett, analysts.

Saline.

Calcium carbonate	grains	per	gallon. 57.91
Potassium sulphate	"	"	36.87
Calcium sulphate	"	"	46.64
Magnesium sulphate	"	"	92.43
Phosphates	"	"	Trace
Borates	"	"	Trace
Lithium salts	"	"	Trace
Barium salts	"	"	Trace
Ferrous salts	"	"	Trace
Sodium chloride	"	"	2,411.98
Calcium chloride	"	"	209.99
Magnesium chloride	"	"	133.74
Magnesium bromide	"	"	13.51
Fluorides	"	"	Trace
Silicates	"	"	1.07
Organic matter	"	"	Trace
Total			3,004.14
Hydrogen sulphide	cubic	inches.	15.527

Warners Spring, Albion, Calhoun County. —— ——, analyst.

Alkaline-Chalybeate.

Calcium bicarbonate	grains	per gallon.	16.93
Magnesium bicarbonate	"	"	4.70
Iron bicarbonate	"	"	1.70
Sodium sulphate	"	"	2.12
Potassium sulphate	"	"	0.32
Calcium sulphate	"	"	3.39
Sodium chloride	"	"	1.25
Alumina	"	"	0.25
Silica	"	"	0.18
Organic matter, loss	"	"	1.02
Total			31.86

St. Clair Mineral Spring, St. Clair Springs, St. Clair County,

Saline.

Calcium carbonate	grains	per gallon.	0.15
Magnesium carbonate	"	"	1.10
Calcium sulphate	"	"	140.19
Sodium chloride	"	"	9,565.01
Calcium chloride	"	"	2,437.49
Magnesium chloride	"	"	398.38
Alumina, silica	"	"	29.41
Bromine	"	"	Trace
Iodine	"	"	Trace
Total			12,571.73
Hydrogen sulphide	cubic	inches.	16.43

Otsego Mineral Springs, Otsego, Allegan County. R. C. Kedzie, analyst.

Chalybeate.

Calcium bicarbonate	grains	per gallon.	14.29
Magnesium bicarbonate	"	"	1.52
Iron bicarbonate	"	"	2.11
Potassium sulphate	"	"	1.15
Calcium sulphate	"	"	0.68
Sodium chloride	"	"	1.65
Silicates	"	"	2.80
Organic matter, loss	"	"	2.10
Total			26.30
Hydrogen sulphide			Trace
Carbonic acid	cubic	inches.	8.00

Wyandotte White Sulphur Spring, near Detroit, Wayne County. Courtis, analyst.

Saline.

Sodium carbonate	grains	per gallon.	30.38
Calcium carbonate	"	"	44.30
Sodium sulphate	"	"	25.80
Potassium sulphate	"	"	Trace
Calcium sulphate	"	"	89.21
Magnesium sulphate	"	"	48.35
Sodium chloride	"	"	22.90
Potassium chloride	"	"	Trace
Iron oxide	"	"	0.25
Alumina, silica	"	"	1.65
Carbonic acid	"	"	30.50
Total			293.34
Hydrogen sulphide	cubic inches.		20.00

Spring Lake Magnetic Well, Spring Lake, Ottawa County. C. G. Wheeler, analyst.

Saline.

Sodium bicarbonate	grains	per gallon.	0.05
Calcium bicarbonate	"	"	0.13
Magnesium bicarbonate	"	"	0.01
Iron bicarbonate	"	"	1.01
Manganese bicarbonate	"	"	0.05
Sodium Sulphate	"	"	46.70
Sodium chloride	"	"	405.53
Potassium chloride	"	"	4.29
Calcium chloride	"	"	113.42
Magnesium chloride	"	"	36.20
Bromide	"	"	2.17
Lithia	"	"	Trace
Alumina	"	"	Trace
Silica	"	"	0.50
Ammonia	"	"	0.02
Organic matter	"	"	18.29
Total			628.37

Eureka Well (Bromo-Hygeia Mineral Water), Coldwater. A. B. Prescott, analyst.

Saline-Chalybeate.

Aluminum sulphate	grains	per gallon.	43.51
Calcium sulphate	"	"	12.90
Sodium sulphate	"	"	0.13
Magnesium bromide	"	"	101.19
Iron chloride (ferrous)	"	"	3.67
Iron chloride (ferric)	"	"	11.27
Calcium chloride	"	"	1,535.78
Magnesium chloride	"	"	791.42
Sodium chloride	"	"	10,911.25
Sodium silicate	"	"	1.67
Manganese salts	"	"	Trace
Hydro sulphuric acid	"	"	Trace
Total			13,412.79

And the following, with no published analysis, reputed to be:

Saline: Flint's Magnetic Springs, Three Rivers, Saint Joseph County.

Calcic: Grand Ledge Magnetic Wells, Grand Ledge, Eaton County.

Shawnee Mineral Springs, Monroe County.

Mineral Well, Arcade Building, Grand Rapids, Kent County.

Chalybeate: Ogemaw Mineral Springs, Ogemaw County.

Sulphur Springs: In Ash Township, Monroe County.

In Brownstown Township, Wayne County.

In Exeter Township, Monroe County.

At Dearborn, Wayne County.

Near Dundee, Wayne County.

At Gibralter, Wayne County.

Near LaSalle, Monroe County.

Near Rainsville, Monroe County.

Sulphuretted: Alpena Magnetic Well, Alpena, Alpena County.

Not characterized:

Americanus Well, Lansing, Ingham County.

Blue Rock, Grand Rapids, Kent County.

Clark Red Cross Well, Big Rapids, Mecosta County.

Eastman Springs, Burton Harbor, Berrien County.

Pagoda Spring, Mount Clemens, Macomb County.

"Magnetic" Mineral Springs, Spring Lake, Ottawa County.
Plymouth Rock Well, Plymouth, Wayne County.
Salutan's Mineral Spring, Saint Clair, Saint Clair County.
Sprudel Water, Mt. Clemens, Macomb County.
Zauber Wasser Springs, Hudson, Lenawee County.

The localities of but very few of the mineral springs have been improved, and none of them can justly claim to be popular resorts. Those of Saint Clair and Mount Clemens are partial exceptions. The former is in the immediate vicinity of one of the oldest organized communities in the State, a town of about three thousand inhabitants, occupying a healthful site on the west bank of Saint Clair River, about sixty miles from Detroit, and offers excellent hotel accommodations in connection with, or apart from the Bath House and springs. The waters are elaborately utilized, by means of elegantly fitted bath rooms, plunge baths and swimming basins.

The bath houses of Mt. Clemens Mineral Springs, also, are large and commodious structures, some erected with brick and stone, others in wood, and are rich, artistic and imposing in design, fitted out with modern and the latest improvements necessary to make such establishments complete in all their details.

For the properties of these waters, as of all the rest, the reader should refer to the analyses, as above given. With reference to them in general, the State Board of Health Report for 1877, remarks: "Some of them are very valuable as baths, notably the salt and sulphur springs, while all are serviceable in certain forms of disease."

WATCHFUL SEXTON.—A man strolled into a fashionable church just before the service began. The sexton followed him up, and, tapping him on the shoulder and pointing to a small cur that had followed him into the sacred edifice, said:

"Dogs are not admitted."

"That's not my dog," said the visitor.

"But he follows you."

"Well, so do you."

The sexton growled and immediately removed the dog with unnecessary violence.—Tit-Bits.

HEIGHT AND DISTANCE FROM SEA AFFECTING CLIMATE.

The effect of elevation in lowering temperature depends upon the fact that, as heat is very slowly communicated from stratum to stratum of the air, and as the air is warmed chiefly by the surface of the earth, the lowest layers are the warmest, and the temperature on the tops of mountains is therefore much lower than on the plains below. The difference is, however, far more marked in the day time than at night, and in summer than in winter. During severe frosts the conditions are generally reversed, and the temperature rises with height instead of becoming lower, so that a thaw often sets in upon the hills while the frost is still unbroken in the valleys below. If the air were perfectly dry the rate at which the temperature would fall would be 1 deg. Fahr. for every 180 ft. ascent. Inasmuch, however, as the atmosphere contains moisture which is liable to be condensed by cold, the latent heat given out in condensation diminishes the rate of cooling, so that the rate of lowered temperature as a general rule may be taken as 1 deg. Fahr. for every 300 ft. in altitude. Solar heat, being the source of all energy, exercises supreme control over climatic conditions. Radiant heat, or the the heat radiated from the sun, although possessing great power of warming solid and fluid bodies on which it falls, has little power of heating the air through which it passes. Were it not for the watery vapor contained in the atmosphere radiant heat would pass through it without raising the temperature. It is the shade heat, or the heat reflected from the surface of the earth, whether land or water, and directly warmed by the radiant heat emanating from the sun, which regulates the temperature of the air. Winds, for example, convey over immense distances the temperature of the regions from whence they arise; while owing to the greater specfic heat of water, which is as four to one compared with that of land, water takes longer to warm as well as to cool. Hence, the sea remaining open, except in the Polar regions, is constantly modifying the strata of air coming in contact with it, and thus moderates the heat in summer and the cold in winter. It is on account of this specific heat of water that insular climates are more equable than continental, the summers being cooler and the winters warmer.

HEALTH AND ECONOMICS.*

By F. J. Van Vorhis, M. D., of Indianapolis, Ind.

In 1881 the General Assembly of this State passed a law creating the State Board of Health. It has now been in existence about sixteen years. When created it was grudgingly allowed the sum of $4,000 per annum to do its work; and the Legislature, with its eyes on the dollar and with property interests more in mind than the value of human life, struck out of the bill by which it was created much of the machinery intended to facilitate the board in its work, because that machinery would cost a few hundred dollars per annum.

It is hardly necessary to say anything to impress upon this body of intelligent workers the importance of this work; but I would like to join you, if I can, in saying something that would impress the people of this State, and particularly of its capital city.

Marion County had, in 1890, a poulation of 141,156. During 1894 there were 1,834 deaths in the city of Indianapolis, and in the county of Marion, 2,190. This was a death rate of about sixteen per thousand. An examination of the reports will show that it is a very low estimate to say that three out of every sixteen resulted from preventable diseases. This, too, without counting consumptives as victims of preventable disease. It would be very easy for the Board of Health, if supplied with sufficient means and the power to make proper regulations, to reduce the death rate in the county to thirteen per thousand. What would this reduction in the death rate mean, financially? In the year 1894 it is a low estimate to say that the unnecessary loss of life in this city of Indianapolis amounted to about 425. It is estimated by the United States government that the value of a soldier is $1,000. The estimated value of a human life to the country made by the register general's office in England is $720. If we take the English estimate the money value, upon a purely business basis, with no higher estimate of a human life than that of hogs or cattle, lost in Marion County in 1894 was $305,500. According to the English estimate, certainly a very conservative one,

*Read at State Conference of Health Officers, Indianapolis, Ind., May 11, 1897.

there is enough sick from the same class of preventable diseases, to make 720 days of sickness for each death, counting those who die and those who are sick that do not die.

If this calculation be confined to preventable deaths in Marion County in 1894, and the estimated average number of days' sickness to each death, will make the whole number of days' sickness 305,500. The Massachusetts estimate of the loss by each day's sickness is $2. This is also a very conservative estimate, and makes the whole loss to Marion County for 1894, by sickness, $611,000. Add to this the money value of the lives lost, and the whole loss is $916,500. This calculation takes no account of many losses that may be traced more or less directly to the same cause. Most of these deaths and of this great loss occurred within the corporate limits of the city of Indianapolis. Such facts are, no doubt, familiar to most of you; I only refer to them for the purpose of making a contrast.

In this city we maintain a fire department for the protection of property at an expense of about $100,000 per annum. We maintain a police department for the same purpose at about the same cost. We expend on our streets $250,000 more, and run ourselves in debt for another half million to buy waste land for public parks, and with all this lavish expenditure to protect property and increase the value of it our city health board is allowed $5,000 per annum to protect the lives of men, women and children. Three or four sanitary policemen are expected to police a city twenty miles in circumference. On this small sum and with this small force the Board of Health is expected to take care of the sanitary condition and keep a record of the vital statistics of a city of more than 100,000 inhabitants. It is absurd; it cannot be done. Outside of the insignificant salary allowed the secretary of the State Board and the stenographer for the board, the last Legislature allowed $3.400 for the work to be done by this board. Every man who voted for such an allowance ought to hang his head in shame. It is preposterous; it is wicked, to thus curtail the work that is of so great importance. It is utterly impossible to do more than to make a mere beginning at what ought to be done by this board. If the appropriation had been $50,000 it would not have been out of proportion to other appropriations made, when the importance of the work is considered.

I am not able to give you a calculation for the State similar to that which I have given for Marion County, to show you the loss

that the State has suffered; and if time was at my disposal now, would hardly permit it to be done. This much is certain, that there has been proportionally the same amount of loss to the whole State, and it will not amount to less than $15,000,000 per year. If there was any real and worthy purpose in the creation of the State Board of Health it was to save life and to save our people from the thraldom of preventable diseases, and to give them, to the limit of science, the ease and comfort that comes from good health. But if we come down from this higher purpose it may be said that the purpose was to prevent the enormous waste of productive power and accumulate capital.

Questions are being crowded upon the attention of our health officers to-day, the magnitude of which cannot be exaggerated, and upon the solution of which depends consequences far reaching and of the gravest character.

The character of our food supply and its adulterations, the proper care and treatment of animals to be used for food, the preservation of our water supply and the furnishing of pure water, the disposal of refuse matter about our centres of population, are all questions of the gravest importance that at once indicate the close relationship between hygiene and economics, even should it be admitted that economics is no more than a science of pure selfishness.

With all this mass of work pressing upon the board, the public indifference is little less than appalling. The boards of health of Indiana, State and local, are expected to do all this work, grapple with all the problems mentioned and many others of equal importance and equal gravity with appropriations so small that the work of the bravest, most industrious, most competent official is almost destroyed even before it begins.

We have reason, now, to congratulate ourselves and the State upon the present construction of the State Board, and that we have a health officer competent and whose heart is in the work; but this board needs the co-operation of the general public, and this will only come when the people and their representatives in the halls of legislation are fully awake to the importance of preventive medicine. This opens another field of work for the board, that I will suggest, for I am merely suggesting and not attempting to discuss anything.

When properly understood and a sufficient appropriation is made the Board of Health will be a part of our system of education. I have taken occasion more than once to complain that the board has

made no effort to educate the public. Several years ago the friends of sanitary science and those interested in the work of the board held a few meetings in different parts of the State; but these meetings were soon discontinued for the reason, in part, no doubt, of the small appropriations. What the people need is not papers from foreign sources, discussing scientific subjects they do not understand, but practical teaching of the simplest elementary principles to those who do not know them.

If one half of the knowledge, as it now stands, could be made to serve the needs of society, how wonderful would be the improvement. Of what use is all the vast accumulation of scientific and statistical knowledge, unless it can be so applied that it will improve the condition of men, women and children. Investigation and increase of knowledge is all right; but it is not this we want half so much as the teaching of the simple elementary principles of hygiology to those who do not know them, who have never had an opportunity to know them, who by reason of their want of knowledge, are too ofen the unconscious executors of their own children, or the destroyers of their own lives.

There are those, no doubt, when you have presented for their consideration, for the first time, these estimates of losses entailed by preventable diseases, will hear it with incredulity. If so, then they will be still more incredulous when you assert that these losses, great as they are, are only a tithe in comparison with the losses resulting from causes over which the board can exercise no control except by educational methods.

Hygiology is at once a science of preservation and prevention—a preservation of life and a prevention of that which destroys life. This preservation and this prevention cannot be brought about by law alone. A part of the field covered by the restraints of legal enactments is small. The remainder of the field must be worked by educational methods.

The thought that was in my mind when the bill for the organization of the State Board of Health was drafted was that its work would be principally educational. I have felt much disappointed that so little effort has been made in this direction. I venture now to express the hope that some effort will now be made by the health department along this line, even if the appropriation is small, and that when the next Legislature assembles an effort will be made to impress upon them the importance of a sufficient appropriation to enable the board to engage in this much-needed educational work.

SCARLET FEVER AND SANITATION.*

By N. D. Coxe, M.D., Secretary of the Owen Co. Board of Health, Ind.

Of the acute diseases, which are exclusively transmitted through the human body, scarlet fever in its relation to the health of the race holds the first place, since the frequency of smallpox, through protective measures, has been reduced to a minimum. Scarlet fever is generally recognized by a diffuse eruption over the body, with an angina of more or less severity. It is highly infectious, and when in the stage of desquamation the fine, branny-like scales infect rooms, clothing, furniture, and, in fact, everything else with which it comes in contact. In all probability, the infection is confined to the period of scaling off, as it is called, and if strict antisepsis and isolation be rigidly and intelligently enforced in all cases, mild or malignant, there is but little doubt that the disease could be stayed in its course, and many lives, great suffering, and often an impaired constitution for life would be avoided. To this end, instead of wearying you with a tedious history of this dangerous disease of childhood, I propose to devote a few moments in as practical a way as I can to the very important question of how to manage cases of scarlet fever so as to prevent its further spread.

As said in the beginning, the scarlatinous virus surpasses any other eruptive fever except variola, in its tenacious attachment to objects and its portability to distant localities.

The disease factor, the infective agent, is as yet unknown. That the disease is due to some form of micro-organism there can be no doubt, and that it may be figured as being a minute form of life. The lesion of the kidney appears to be due to some poison produced in the body during the disease. One of the most marked features of the disease is the predisposition which it entails to the incursion of pathogenic germs other than those we believe to cause the disease itself. Thus an infectious, croupous inflammation in the mouth, tonsil, pharynx and trachea, due to a streptococcus, is a frequent complication. True diphtheria, due to the Loffler bacillus, is also prone to establish itself upon the vulnerable inflamed mucous membrane.

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*Read at State Conference of Health Officers, Indianapolis, Ind., May 11, 1897.

One attack of scarlet fever, like smallpox, protects the organism for life against the infection. Exceptions to this rule are rare. Among the peculiarities of the infective material is that it may attach itself for months and years to clothing, bedding, house utensils, furniture, books and walls of dwellings, and all other objects with which it comes in contact. The usual methods heretofore employed in the disinfection of rooms, furniture, books and clothing has been in a majority of instances of no avail whatever and powerless to destroy the germs of the disease. We can only depend on freeing from the infectious material those articles of attire and furnishing by the most rigid antisepsis and isolation of the patient, and the use of such agents as science has brought to our notice on all objects that have been exposed to the poison.

It being granted that the infectious material may be carried in the clothing and in books, so also must it be deemed possible for adults, healthy people, physicians and all others who have been in contact with the disease to carry the germs on the hands, in their hair and clothing. Cases of this kind are by no means rare where the infection has been carried in this way. A case comes to mind of the long life and the highly infectious nature of this disease.

Germs live for years. Several years ago an epidemic of malignant scarlet fever invaded my town. Many children died. In a family where all had the disease and in which two died, the clothing and toys of the baby were put away in a box or trunk and securely fastened. Several years after, and in another house where scarlet fever had never been, another child was born in the family, and after it grew to be nearly two years old, the fond mother opened the trunk and allowed her last born to play with the toys of its dead sister. In the usual time it was stricken with malignant scarlet fever and soon succumbed.

Smith, in "Disease of Children," relates that a "librarian of a circulating library of a Sunday school, whose pupils came largely from tenement houses, was occupied a considerable part of a day in covering and arranging books. After about the usual incubative period of scarlet fever he sickened with the disease. His two sisters were immediately removed to a rural township, three hundred miles away, and to an isolated house where scarlet fever had never occurred. About one month after his recovery, and after his room had been disinfected by burning sulphur and his bedclothing and linen had been thoroughly washed, and all articles suspected to hold the poison had been disinfected or burned, the

brother visited his sisters in the country. Three weeks subsequent to his arrival one of these sisters sickened with scarlet fever, and a week later the other also. It seemed that the exposure must have occurred several days after his arrival in the country from some book or other infected article in his possession.

Such histories and experiences are not infrequent. They are common during epidemics of scarlet fever. They indicate an extraordinary attachment of the scarlatinous poison to objects, and show it is not gaseous nor readily volatilized. The fact of its portability and attaching itself to objects—carried long distances—that the poison is a fixity; that it is a germ, and that almost to a certainty the poisonous principle is confined generally, if not always, to the fine branny scales, and that the danger lies entirely in the period of desquamation, makes it criminal for physicians and nurses to neglect in the least strict quarantine and rigid antisepsis, for, in these precautions, intelligently and systematically enforced, lies the only hope of eradicating this highly infectious and dangerous disease. In the present state of our knowledge, the most reliable and certain prophylaxis is the isolation of patient and nurses and the thorough and judicious employment of disinfectants upon their persons and in the apartments. All furniture and articles not absolutely required should be removed from the sick room, and no one should be allowed to enter it except the medical attendant and the nurses. Constant ventilation should be insisted upon by raising the lower sash of the window a few inches in mild weather. Even in stormy weather sufficient ventilation can be insured in this way without exposing the patient to currents of air, which should be avoided. The temperature of the room should be kept at about 70 degrees. Articles used about the patient, such as sheets, pillow cases, blankets or clothes, must be removed from the sick room until they have been disinfected by placing them in a tub of boiling water, in which carbolic acid and sulphate of zinc have been added, or in corrosive sublimate solution 1 to 1,000. They should be soaked in this for at least an hour and then again placed in boiling water for washing. Vessels used by the patient should have some of the disinfecting fluid constantly in them, and, immediately after being used by the patient, emptied and cleaned with boiling water. Water closets where the discharges are emptied should be disinfected from day to day during the illness by lime or sulphate of zinc. All straw and feather beds should be burned, and the last should never be replaced. An old feather bed, handed down from generation to

generation, is an abomination in the sight of all sanitary nations and peoples. Old sterilized cloths should be used about the patient instead of handkerchiefs, and when once used should be burned. The patient should be kept well anointed with carbolized vaseline or lysol and vaseline, as it not only serves to allay the intolerable itching, but serves the double purpose of rendering the fine branny scales heavy, thus preventing them from flying about the room, and also probably destroys to a large extent the infectious principle of this disease. The physician, before entering the sick room, should anoint his face and hands with the above ointment; should put on a closely fitting gown and hood. After coming out he should remove them, place them in a close-fitting bag, in which is a piece of cotton saturated with formaldehyde. He should wash and disinfect his hands and face before leaving for his office or home, or to visit other patients. The nurses should use the same precautions, and before leaving the house should take a bath, with a complete change of clothing. After convalescence is fully established, and after there has been complete desquamation, the rooms, clothing, furniture and everything else that has been in the least exposed to the scarlatinous poison should be thoroughly disinfected. Probably the best, cheapest and safest germ destroyer is a new disinfectant, formaldehyde. Because of its cheapness and simplicity in using, boards of health are generally recommending it. Perhaps all we are told in its praise is not entirely warranted, but enough is proven to establish its high value in this direction.

THE WRONG POCKET.—Two ladies entered a car at an hour of the day when seats are a possibilty. One was a stout, over-dressed lady, the other was evidently her daughter. "Shall I pay the fare, mamma? I have my purse with me," said the young lady sweetly. "Oh, no; I'll pay. I have plenty of change." Thereupon she leaned sideways and commenced the intricate process of searching her draperies for her pocket. After a minute or two of fumbling, during which her face grew an apoplectic red, she exclaimed, tragically, "Laura! what shall I do? I've been robbed! My purse is gone—my pocket is entirely empty." "Perhaps, madam," said the gentleman by her side, into whose coat-pocket she had thrust her hand, "perhaps if you search your own pocket instead of mine you will be more likely to find your purse."

THE CAUSES AND PREVENTION OF WATER FERMENTATION.*

By Samuel McElroy.

Rapid progress in biological science, coming, as it does, to the aid of chemical science, and, in such cases as water analysis, furnishing what hydraulic engineers have long felt to be a needed supplement, within twenty years has changed the theories and practice of our medical authorities, and is rapidly leading, in agriculture and otherwise, to radical changes important to public welfare.

The fermentation of water is a subject which grows in importance with the rapidly-growing demand for, and distribution of, water in the various centres of population. The careful student who has collated the experience of the more populated centres on this point finds that fermentation is an active and universal law of depuration in reservoirs and other bodies of water, and demands a systematic attention which it has not, as yet, received in water-supply design.

Contamination, year after year, both in summer and winter, of the most prominent supplies has shown, at times, to any careful observer, the effects of the process by which nature depurates contaminated water. These effects have differed in period and intensity, but their occurrence has been common.

Actuated by local pride, when troubles come which should have been anticipated and prevented, city authorities have, in various times and ways, glossed over, tried to explain away, or ignored these evidences of contamination; and quite a number of those who ought to know better—chemists, biologists, engineers, commissioners—have insisted that the trouble was only temporary, its causes more or less mysterious, its effects more or less mythical, and its sanitary effects harmless. The good name of the supply is to be guarded, and the suffering consumers are cautioned against any public clamor.

The general panacea of these wise men is flushing the mains at the street hydrants,—an operation performed at night, to save critical eyes from a shock. This shows what deposits the mains collect under their usual slow motion, and discharge under rapid

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*From Engineering Magazine for July, 1897.

currents; and it usually aggravates the trouble, since the oxides of constant pipe-disintegration are, in themselves, valuable correctives, and, if the reservoir is contaminated by what it accumulates in its depths, the renewed supply more surely shows it, under the erróneous practice which neglects surface flow into the mains.

To the hydraulic engineer who has made this process a study, and is familiar with the theories and remedies of ancient practice, the causes and effects are plain, and the remedies equally so. Unfortunately, however, in the engineering profession struggling through a transition stage, studied experience has no adequate market value, and centres of population gain lessons by a prolonged suffering which is strangely universal.

Two great natural laws come into action here. From its abrasive weight, its absorbing power, its active solutions, and its incessant motion, water as rain, as flowing veins and currents, as expanding ice, or when distilled by evaporation, becomes rapidly contaminated in its descent through the atmosphere and its flow over, or through, the earth. It rapidly takes up, or becomes impregnated with, vegetable and animal matter, diseased or dead, and mineral salts.

Then, in the wonderful provision made for man's comfort and health, come into action the sanitary forces whose office is to depurate this organic pollution. Sunlight, as heat and otherwise, has one function; oxygen in aeration and motion has another; and the teeming sanitary police of the lower organic world, the algoid and fungoid ministry, with that of the protozoic forms, come in to fulfil their important share of the work. These forces—heat, air, and microbes—are the remedial trinity of diseased water.

The cause, then, plainly, is contamination by diseased or dead organic matter; and, since fermentation is, generally, nature's corrective remedy, the process here is putrefactive fermentation; and the odors and flavors observed are the usual evidences of this process, which must continue until depuration is accomplished. No scientific student considers heat, or oxidation, or microbes a direct cause of this phenomenon. He knows perfectly well that each is simply remedial for a distinct organic cause.

Let us now apply these premises to the supply-condition of the fourth city of the United States. Brooklyn, in 1895, is reported to have used 80,124,432 gallons of water per day, or more than 100 gallons per capita, for the twenty-five wards supplied by the city works.

The city works department, from amounts raised by tax and assessments, expended in 1895, $5,827,482, of which $761,717 was for water maintenance, including the respectable sum of $393,275 for salaries alone.

In addition, the house-holders paid $1,863,678 as water rates—a total of $2,625,495 for the luxury of water-supply.

Brooklyn inaugurated in 1856 a supply of the highest rank in quantity, quality, and availability. The engineering theory of this plan may be thus stated:

Long Island, in the main, is composed of a porous mass of sand and gravel, sloping up from the ocean on one side and the sound on the other to a central ridge, which rises several hundred feet above tide, and contains occasional deposits of clay, bowlders, etc. The rain falling on this surface is readily absorbed, and passes down to a saturated bed, as through an enormous filter, which rises landward from tide-level, with an hydraulic frictional slope, generally of eight or ten feet per mile, except near tide. On the Hempstead plains, at a distance of 9.38 miles from tide, and a ground elevation of about 210 feet, the water stands 78 feet above—a mean slope of 8.34 feet per mile, and a direct filtration, to reach it, of 132 feet.

Along this southern slope, easterly from New York Bay, depressions occur at frequent intervals in this formation, near tide, generally as swamp beds from which powerful springs issue, forming creeks, each flowing to tide through its own valley; and there is considerable appropriation of these as mill-ponds, near tide.

Under the plan of 1856, an intercepting aqueduct was built, from the Ridgewood pump well to Hempstead reservoir, 12.39 miles, completely controlling a basin of 88.64 square miles. Of about eighteen creeks which it crossed, five of the more prominent were selected, the mill-ponds being formed into supply reservoirs, and a sixth was excavated on Clear Stream. Abundant experience has shown their flow—about 36,000,000 gallons per day; the rest, on a catchment of not less than 1,200,000 gallons per square mile, or 106,000,000 per day, wasting at tide unless intercepted.

In 1875, under the Kingsley regime, Brooklyn expended about $1,500,000 for the Hempstead storage reservoir, endorsed as capable of furnishing 100 days' summer supply of 10,000,000, in addition to the creek flow of about 8,000,000. It has a maximum capacity of 850,000,000, at a depth of 29 feet, which it has never been able to realize, and its capacity at any level suppresses the natural stream flow in proportion.

In 1892 an extension aqueduct was built, to Massapequa, a point 22 miles from the pump well, which intercepts a basin of 88.5 square miles. On this five supply reservoirs were built, credited with a gravity flow of 31,700,000, in 1895, from a total daily basin flow of about 106,000,000. The streams which feed these eleven reservoirs vary in length from 1.3 miles (Newbridge) to 4.5 (East Meadow), on the Extension, and 2.5 (Jamaica) to 3.25 (Hempstead) on the original line. They outcrop in depressed basins, in which masses of swamp growth have accumulated; various similar pond depressions occur in their descent, and the lower ponds have swamp inlets.

Jamaica Valley, for a mile above the reservoir, has a broad swamp area, of about a quarter of a mile wide. In building the embankment of the South Side Railroad across it, the writer had the swamp peat excavated, in some cases to a depth of more than four feet, to get a firm slope rest.

On the extension the city acquired for aqueduct right of way and pond construction 484 acres, with 810 acres of head swamp lands, leaving about 802 similar acres on the five streams yet to be purchased; and the actual area of pond excavation, for a minimum depth of 2½ feet, appears to have been about 69 acres.

The new storage reservoir of 1875 was incomplete, when abandoned, 47 acres in the valley remaining entirely uncleared of rank vegetation. Kept, as it necessarily is, at about half-depth, rank vegetation grows at the head, to add to its supply contamination.

On the extension, then, the water, however pure when it crops out in bed-springs, is in direct steepage contact with about 1,540 acres (nearly 2½ square miles) of vegetable contamination; and on the main line no adequate effort has been made to remedy a similar exposure—for a swamp depth of 4 feet, in some cases.

In the winter, when a sleet storm comes on the frozen ground, a large surface wash into the reservoir occurs, carrying its quota of organic matter from a highly-cultivated district and producing strong discoloration in the city mains.

As early as 1872 a supplemental supply by detached wells was commenced, below the aqueduct. This has been rapidly extended, so that, on the main line, eight stations are now in use, while on the extension, the same method is being largely applied. Excepting two cases of "sunken wells," these are "driven tubes," using each about 100 2-inch tubes driven to great depths—45 to 90 feet or more.

Experience shows that instead of securing, as was expected, filtered water of great purity, none approaches the purity of the gravity outcrop—about 3 grains of solid matter per gallon. The sunken well at Smith's pond, fed from it, in November, 1890, gave 3.66 grains (100,000 parts); Forest Stream, 5.84; Clear Stream, 6.04; Baiseley's, 10.28; Spring Creek, 17.96.

There are two, sometimes three, explanations. First, that, the passage along the tube downward to the suction-point being vertical, with less descent friction, and also cleared from the fine sand in interspaces, the tubes draw surface water, rather than that of the lower horizontal beds; and this is swamp, or surface-contaminated. A property-owner and long resident on the extension says:

"I know every pump or well driven by the contractors between Freeport and Wantagh, and pumping now; nearly all of them are in swamps. * * * The pumping station at Clear Stream is shut down. The whole pond is but little more than a morass, being overgrown with water-grass and weeds."

Of the actively-pumped and costly Spring Creek well, E. H. Bartley, chemist, says in the Board of Health report of 1885:

"The wells (tubes) are located on low ground, near a former stream and swamp, both of which are now drained entirely dry. The distance from the Jewish cemetery is 370 yards. The land about the station is under cultivation, by frequent applications of stable manure. * * * The influence upon (neighboring) wells and subsoil water extends much farther than the distance to the cemetery. It is, in my opinion, demonstrable that the subsoil drainage from the cemetery and filthy barnyards in the neighborhood finds its way into these wells, and thence to the general water-supply of the city."

This is accompanied by an analysis, giving solid contents (100,000) of 33.4 grains and ignition loss (organic) of 12.28.

A second source of accumulated matter is found in the motionless condition of these deep beds, and their constant reception of whatever impurities reach the surface of the saturated bed, and continue to descend without being carried off. It is well known that nitrifying organisms rapidly diminish in number with increased filter-bed depth, and at these great depths they cannot act.

A third danger, and at least occasional contamination, comes from the objectionable proximity of these deep tubes to tide-line, some being not 500 feet distant, and 45 to 90 feet below tide-level. Whenever, then, the tidal pressure exceeds the landward slope pres-

sure, in a case where these wells at work lower the saturated level 3 to 10 feet, salt water will begin to saturate the intervening bed, and, as time goes on, the supply will become more brackish, and must be abandoned.

To all these contingent risks and facts of contamination must be added the increase of population, agriculture, manufacture, and the like, on the feeding area of this saturated bed, and along the flowing creeks in use. Sewage, farm manure, and factory pollution must be expected, and must be provided for wisely and effectively.

The original contract and specifications for these works were drawn by the designing engineer, and the works were constructed substantially in accordance therewith. They contained three special provisions against fermentation, in a case where less than 10,000,000 per day could be used, and where the 20,000,000 provided for would not be required for fourteen years.

Under the first provision, as to the ponds below the flow lines, all vegetable and perishable matter must be cleared.

The second made the westerly supply reservoir, Jamaica, a depurating reservoir for the entire supply, from which, by careful subsidence and surface-decantation, the purified flow could enter the aqueduct.

The third formed the Ridgewood distributing reservoir in three apartments, from which, by the same process of subsidence and three-fold surface-decantation, through connecting wells, the purest water could enter the mains.

For the extension, then anticipated, and, in fact, provided for by the purchase of important ponds, Smith's pond was provided for a similar depurating reservoir.

In the actual construction of the original work, and on the extension, not one of these four safeguards has been properly secured —the last three not at all. In fact, the fundamental plan of the works has been so far ignored that, when, even in 1895, the lower main aqueduct, capable of eventually carrying 100,000,000, was used for a flow of 43,800,000, the remainder was passed, at very great pumping expense, through a 48-inch main, from Millburn engine-house, though the main cost, at the outset, about $1,100,000, with a probable life of not much more than thirty years. A second more valuable 66-inch steel pipe is now under contract at nearly $1,000,000 more.

Under public clamor, and a hurried common council appropriation, steps were taken to clean out one of the ponds. As an addi-

tional safeguard a laboratory for analyses has been established at Rockville Centre, to eventually determine the cause of the putrefactive fermentation.

Much credit is claimed by the department for three years' expenditure in cleaning ponds, and is due for what has been done; but there is still, on a large scale, constant exposure to local contamination, which is the source of the present trouble.

Health Commissioner Emery ascribes the bad odor and color to the "presence of living and decomposing vegetable matter in the ponds, reservoirs, and distribution system." This opinion is concurred in by Drs. Bartley, Hutchinson, and others, from personal inspection of a "large collection of decaying vegetable matter" in the ponds.

These conclusions, in the opinion of the engineer-in-charge, furnish "a partial, though still imperfect, designation of the origin of the trouble, but its specific cause remains undefined." His remedy is "the continued observation, examination, and analysis of all our sources of water, so that we may become thoroughly familiar with their characteristics, and the most efficient treatment in any given case." This is further defined as, "not only chemical analysis, but color tests and biological examination, embracing that of the microscopic organisms, and that of the bacteria, as well as their complete differentiation in each case, as far as practicable; * * * experiments made to ascertain the mode of operation of the cause of the trouble, and corrective treatment to be applied."

The only consistent and proper remedy, then, for a dead horse on the street is a series of laboratory analyses to ascertain. as far as practicable, a suitable remedy!

The theory of the original plan was simple, effective, and economical. From a level near mean high tide, as we have seen, the vast saturated sand and gravel bed of the southern slope of the island rises towards the central ridge on an hydraulic slope of about eight and a half feet per mile. The upper roof of this slope, along the line now controlled by the Brooklyn aqueduct, daily discharges towards tide about 205,000,000 gallons of the purest filtered water, under the surface.

Could a more simple problem in hydraulic engineering be presented than the effective interception of such a flow, on such a slope, not where it crops out to be contaminated, but where it flows, clear and clean? It would make an engineer of ancient Rome turn in his grave to be told that for thirty years Brooklyn has been

stumbling over this problem; that, after acquiring, at the outset, 36,000,000, with an outlay of $5,400,000, she has since expended for extensions and interest about $33,000,000, including at least $1,750,000 for wells; and that her officials have been contemplating an additional outlay of $25,000,000, to meet the demands of 1900, wandering into northern New Jersey to face a sectional State contest, when all this water, in all its purity, is running to waste, day after day, under its present aqueduct!

Nor is there much comfort promised in the eventual remedy of "sand filtration" discussed. The ancient engineers, by careful aeration and subsidence, oxidized and depurated the organic matter, and thereby, in a simple and natural way, greatly reduced the normal quantity of microbes by clarifying and removing their food-supply. But, in the expensive *single-process* sand filters of the day, so extravagantly lauded, through a bed of two and a half to four feet, all the organic matter, flood-laden or otherwise, is accumulated, and with it a necessary accumulation of microbe organic slime, which pervades the entire bed, and through which every gallon the consumers drink is forced under hydraulic pressure!

For 100,000,000 per day, for Brooklyn, the estimated cost of installation plant is about $1,700,000, with uncovered beds, and $2,700,000, with covered beds; with the comfortable operating outlay of $1,200 per day, uncovered, and $1,600, covered; $438,000 per year in one case, and $584,000 in the other—a sanitary and financial conclusion for tax-payers to study.

SOME CONDITIONS OF LONGEVITY.

"BECAUSE in tropical countries more decayed vegetable matter is found, and in consequence more miasma, the idea has become popular that only vigorous health and long life are likely in northern latitudes where frost now and then asserts itself. The fact that humanity matures much earlier in tropical climes seems to warrant the conclusion that it must necessarily perish much earlier. Dr. Luigi Sambon, of Rome, attempts to put these popular impressions to sleep by an elaborate exhibition of statistics. He doesn't contend that the warmest climate is the most suitable to a man, under the conditions of modern civilization, but he remonstrates vigorously against the idea that a cold and variable climate is the most conducive to the physical and intellectual improvement of the

human race. While northern climates may produce stalwart frames, statistics show that they do not conduce to longevity. In proof of his position the doctor cites the fact that the average Arab outlives the average Esquimau by not less than twenty-five years. He shows that the people who live along the unhealthful coasts of Central and South America survive the inhabitants of the higher and cooler altitudes of the interior. He shows also that the Hindus, who often reach puberty as early as nine years, live to a surprising old age. The inhabitants of the southern countries of Europe are found to live much longer than those of the more northern latitudes. To illustrate, in England in a population of 27,000,000 there are but 146 centenarians, while in Spain, with a population of but 18,000,000, there are 401 centenarians. The probabilities are that the great mortality found in southern latitudes is found in the cities, and is therefore not so much the fault of the climate as of an indifference to sanitary laws."

We have quoted the above from a recent article in the Cincinnati "Times-Star," and in comparison we quote from another recent article in the New York "Sun."

"It is a somewhat curious circumstance that the average longevity is greater in Scotland than it is in England, and greater in Ireland than in Scotland, the birth rate being largest in England and least in Ireland. Of a thousand persons, men, women and children, resident in England, the average number over 60 years of age is 72, or somewhat more than 7 per cent. In Scotland the proportion over 60 is 7.7 per cent, and in Ireland it is 10.5 per cent.

Ireland stands second to France as regards the longevity of its inhabitants, the proportion of men and women in France over 60 years old being, by the last census, 12.7 per cent, or 127 of each 1,000 of population. The official figures of the census report show that longevity is, to a considerable extent, regulated by climate, that is, in countries within the temperate zone, the duration of life is greater than in warmer or semi-tropical countries. The average number of persons over 60 years old in 1,000 inhabitants in the United Kingdom is 77, and in the German Empire, the climate of which is similar, it is the same. In Holland it is also 77; in Denmark, 84; in Sweden, 88; and in Norway, 90. In Russia the longevity of the inhabitants is greatest in the northern provinces and lowest in the southern ones. The average of European countries in the north temperate zones, England, Germany and Holland —77 a thousand—falls to 71 in Austria and Portugal. In Spain,

where the climate is generally milder than in Portugal, the number of persons over 60 years of age in a thousand is 58 only, and in Greece it is 56. In the East Indies, as far as there are any authentic figures, the average is only 40 in a thousand inhabitants. In South America the average is about 50, though there are, of course, many exceptional cases.

"The United States do not stand very high in respect of elderly persons. The duration of human life is longest usually in old, and least in new, countries."

Here we have two views of comparative longevity diametrically opposed and both supposed to be based on reasonably reliable statistics. It is not difficult for one familiar with such matters to detect the fallacy underlying the last extract. Proportionate longevity may or may not be a test of the actual longevity of a people. Very much depends on the birth rate. A country with a low birth rate, other things being equal, is bound to show a larger percentage of aged people. This fact is so obvious that it is strange so many intelligent writers fail to note it. Many town and country districts in our older settled portions have acquired an enviable reputation for health simply because the children and youth are scarce. The birth rate in France has been about the lowest of any European country, hence its remarkable record for longevity. Ireland is another country with a low birth rate, and a heavy emigration confined chiefly to the younger inhabitants. Combined with this cause, however, is that of climate, race and mode of life, which are legitimate factors in determining the actual longevity. The influence of these latter is, in a large measure, indicated in the lower percentages of the warm as compared with the cooler countries.

This brings us to the views of Dr. Sambon. The Arab and the Esquimau are hardly fair subjects of comparison. The one is civilized, the other is a barbarian. It will hardly be contended that the latter, struggling against the rigors of an arctic winter, can be expected to enjoy the longevity of the other. Then, too, we should need to see well-fortified and abundant statistics to support his claim in favor of southern Europeans as against their more northern neighbors. He falls into the same error as the paper last quoted when comparing Spain with England. The best evidence thus far procurable fails to sustain his views. There is in them, however, a certain measure of truth. The old view that a warm climate is necessarily antagonistic to prolonged life must be abandoned. Many countries like Australia, lying within a warm tem-

perate zone, are as favorable to long life and perhaps even more so than others with a cooler climate. Parts of India are as favorable as many European countries to longevity. The life insurance company which can carefully select its risks, no longer regards semi-tropical countries as a barrier against insurance. But the general experience of the companies has been that the countries which, according to Dr. Sambon, are most favorable to longevity do not sustain their reputation when put to the test.—Insurance Monitor.

THE DISMAL SWAMP.—We have many "Switzerlands of America" and health resorts without number, from Maine to Colorado, of more or less prestige, but these are to be rivaled if not eclipsed presently, it is thought, by, of all other places, the Dismal Swamp of Virginia. This hitherto waste and unproductive region has been found, on closer and more scientific inspection, to be by no means as dismal as it used to be depicted in our geographies and to possess features which ought to make it an attractive watering place and sanitarium. It is not, as most people imagine, a vast bog sunk low in the ground, into which the drainage of the surrounding country flows. On the contrary, according to accurate surveys, it is above the level ground, some 15 or 20 feet, and, instead of being the receptacle, is, in its immense sponge-like bulk, gathering the waters that descend upon it, the source of rivers, five of which take their origin within it and flow onward to the sea. The swamp is entirely of green timber; there is no decaying wood, the two principal woods that grow there being the juniper and the cypress, which never rot. They fall on the ground like other trees, but instead of decomposing, they turn into peat, and in that form remain unchangeable and indissoluble. There is nothing in the swamp to create miasma; no rising of the tides and decomposition of rank vegetables; no marshes exposed to the burning rays of the sun. All is fresh and sweet, and the air is laden with balmy odors. The water is tinged with the juniper to a faint wine hue, and it is thought to possess valuable sanitary qualities. It is often used by vessels going on a foreign cruise, on account of its healthful properties, and also because it keeps fresh and clear for years. Those who live near it are not slow to declare that it is the healthiest place on the continent.—Architecture and Building.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Painful Flat Foot.—M. Bloch—"La Semaine Médicale"—thinks that painful flat foot arises from an excessive relaxation of the ligaments that unite the neighboring bones; the three cuneiform and the cuboid. This excessive relaxtion is due, he thinks, to the fact that the bones and their tendons are not held firmly together by the anterior muscles of the leg and the latteral peronei. These muscles, it will be observed, while their action is antagonistic, serve to maintain the convexity of the foot, and this is especially true of the three cuneiform bones. If one of these muscles becomes weak and fails to act, unless another replaces its action these bones are disjointed, and when the weight of the body is placed on them, they yield and the foot becomes flattened. This depression takes place not only in the vertical direction, the pressure spreads the bones in a transverse direction and from within outwards, and presses aside the cuboid bone. The result is that while the foot is flattened the breadth of the foot is increased, especially on the exterior border. In the majority of cases the interior border of the foot resists lateral extension and consequent deformity, because the ligaments on that side are much stronger than those opposed.

M. Maurice Bloch says there is no propriety in retaining the term tarsalgia for the painful variety of acquired flat foot, and gives a decided preference for painful *tarsoptosis*, because there are other affections in the articulations of the tarsus which cause walking to be very painful and have an entirely different symptomatology, and require a different treatment.

The affections that are usually caused by rheumatism, and especially those that arise from nervous complications, are characterized by pain as soon as the patient places his foot on the ground with the intention of arising or walking, or by tropical troubles in the leg sometimes extending up to the thighs, and more particularly by the absence of the sign which he describes under the name "cuboidien," which is pathognomonic of tarsopsis. To discover this sign it is sufficient to press with the thumb on the external face of the cuboid bone and to press this bone from without inwards in the direction of the cuneiform bones. If there is tarsalgia without tarsoptosis, the "cuboidian" sign mentioned above is absent.

TUBERCULOSIS.—MM. Mataillon and Terre have treated the saprophytic form of tuberculosis in men, and tuberculosis in fowls —"Le Progrès Médical," 26th of June:

We have isolated, they say, from a tumor in a carp, a bacillus which developed well at the ordinary temperature, and gave all the reactions of the baccillus of Koch. Some facts led us to consider it as a transformed tuberculosis; we tried to effect this change experimentally. Some carps were fed on the viscera of tuberculous guinea pigs. After eight or nine days the bacilli began to be active in the liver, and after eleven days, they were isolated at the ordinary temperature, and were indentical, morphologically with those we have described. We add that three guinea pigs, into the legs of which was injected the pulp from the liver of a carp that swarmed with bacilli, are in perfect health after a lapse of more than three months, and have not a trace of the inoculation. To eliminate any possible action from the digestive fluids, we made an intraperitoneal inoculation of a very virulent form of tuberculous matter from a human subject; the same result followed.

In a similar way, two groups of frogs were isolated, and inoculated with the tubercular substance—one from the human being and the other from the fowl. The tubercular matter from the human subject had much less activity and we have not as yet been able to separate the cultures. But we obtained a very satisfactory development for the tubercle from the fowl, after a lapse of fifteen days. No morphological trait whatever enabled us to distinguish these colonies from those resulting from tuberculosis in the human subject, having passed through the carp.

It therefore seems that the form which we have described appears to be a saprophytic form of tuberculosis, a form which might be obtained by passing through cold-blooded animals the tuberculous matter from the fowl or from the human subject.

PNEUMOCOCCUS IN HOSPITAL DUST.—Giornale della Reale Societa Italiana d'Igiene, June.—There has not heretofore been given a reliable demonstration of the presence of the pneumococus in the dust in the wards of infirmaries and hospitals. From the observations of the writer it is shown that the dust floating in the ward of an hospital may contain very virulent pneumococci.

Injecting into the peritoneum sterilized water containing some of this dust, twice the injection was followed by a fibrino-purulent peritonitis, with double pleurisy which did not contain the pneu-

mococus. It is important to note that the dust was collected on the 22d of April and was inoculated on the 19th of May, following, a fact which proves that the pneumococus retains its virulence for a long time.

THE TREATMENT OF RABIES.—Can the treatment of rabies cause paralysis? This question was very seriously discussed at a meeting of the Académiè de Médecine.—"Gazette Hebdomadaire," 20 June.

M. Rendu has treated a case of acute paralysis in a boy who attended in the amphitheatre of the hospital, and when in taking away the pancreas of a patient who died of rabies, in the service of Dr. Barth, received a punctured wound. This patient was subjected to a very active antirabic treatment. After a very acute attack the paralysis was arrested. The paralysis was developed during the antirabic treatment, which was not interrupted, and, although the injections were not interrupted, the patient recovered.

The question discussed at the Academie is a very important one. Was the patient, who was subjected to the antirabic treatment, suffering from rabies? Was it caused by the injections? Is paralysis a symptom of an attack of rabbies? Was this patient, who received the punctured wound at the autopsy, suffering simply from inoculation with the toxines of the cadaver which caused the phenomena of infectious myelitis?

HYPNOTISM IN TABES DORSALIS.—M. Em. Spalikowski presented to the Académie des Sciences, a communication on the influence of the hypnotic sleep on the gastralgia that accompanies tabes dorsalis. He says ("La France Medicale," 25th June):

The terrible attacks of gastralgia to which those having ataxia are liable, are well known, especially in what is usually called the first period of tabes; but in the case to which I am about to refer, the attacks took place in the second period.

The remedies heretofore employed have been entirely without benefit to the patient; morphine is too dangerous especially in nervous subjects.

The doctor, therefore, employed hypnotism which afforded him excellent results.

The patient was a woman, 46 years of age, who had suffered from tabes dorsalis for six years. She experienced all the classic symptoms that accompany the first period, and, besides she suffered when her monthly periods returned. They came regularly and

were accompanied with violent gastric pains which lasted from five to ten minutes, and returned generally every six hours, for two or three days. She had none of the symptoms of hysteria.

The attacks were so painful in the beginning that the patient tore her clothes and everything that might be within her reach. I therefore tried to induce sleep by means of passes, and she became so sensitive to them that now it is sufficient to present before her eyes two fingers, the index and medius of the right hand, extended and separated, to induce the sleep.

This I have done for each gastric attack. The attacks have become less frequent, and now she sufferers only from some light cramps which are immediately removed by the hypnotic sleep.

The treatment has lasted three months.

It is impossible not to recognize the favorable influence of the application; the patient has improved much in her general condition, and it is suggested that a series of experiments be made to determine, if possible, the effects of hypnotism on tabes dorsalis.

"CASTILE" SOAP AND THE PLAGUE.—The prevailing impression that the famous soap of Marseilles was made from the pure olive oil of the south of France has been swept away by the fact that the soap factories have been obliged to close because of the quarantine against India. It appears that for twenty years the manufacturers have been supplying the market with an inferior product made from common linseed oil imported from India.—Apropos—

PURE SOAP AS A LUBRICANT IN MEDICAL AND SURGICAL PRACTICE: Not the chipped shavings of the insoluble "castile," or other hard soap, nor the coarse, soft and extra alkaline soft-soap, liable to irritate sensitive surfaces, but Pearline, the exquisitely fine soap powder, quickly soluble in warm water. Every practitioner, above all every obstetrician, should carry a bottle of it in his satchel. It is emolient, antiseptic and cleansing. For those who may persist in the use of vaseline, petroleum, or any other sticky material, Pearline is doubly necessary as a means of washing it off.

DIPHTHERIA STATISTICS published by Dr. Loddo regarding the use of serum in diphtheria, show that in 10,000 cases treated in 86 hospitals in Europe, Australia, Japan and America, the mortality was 20 per cent. instead of 44.3 per cent. under the old method, while in 3,760 cases treated in private practice the mortality was but 7.8 per cent.

EDITOR'S TABLE.

SANITARIAN, AUGUST NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

MAL-ODOROUS WATER AND ORGANISMS.

Asterionella—the alleged head-devil of Brooklyn's mal-odorous water supply—is, as described by Prof. Albert R. Leeds (in his report to the Mayor), a diatom, distinguishable from other members of the family of algae, to which it belongs, "by being enclosed in an envelope or capsule of silica. This particular genus of diatom has also the further peculiarity of secreting a substance in the nature of an oil which possesses a taste and odor so characteristic that, for lack of a better name, I have elsewhere designated it as the asterionella flavor. It is a combination of fishy, salty and oily tastes, its odor strongly resembling that of certain varieties of geranium. In the month of August, when the trouble was at its worst, the water had a white appearance and was filled with minute white threads. On standing, it threw down a flocculent deposit of a stringy, whitish or yellow-white matter. Under the microscope this deposit was found to consist of innumerable asterionella matted together with other diatoms, strung together in threads, the other diatoms, being more especially the melosire, tabellaria and synedra. These thread-like forms have not been noticed to produce the objectionable taste and odor secreted by the asterionella and, moreover, they were vastly less abundant. The water itself was colorless, the apparent color being due to the suspended organisms and their products."

Nevertheless—not that we would cast doubt on Prof. Leeds' diagnosis—in the report upon organisms, excepting bacteria found in the waters of Massachusetts, 1887-1889, by G. H. Parker, biologist,* tabulates the results of five hundred representative observations. "These were separated into two groups, those in which there were no odors, or very faint ones, and those in which the odors were pronounced. Depending upon the absence or presence of a significant number or organisms, these two groups were further subdivided. The number of waters which fell under the four sub-groups thus constituted were:

*Report Mass. State Board of Health, 1890.

"I. *Odors very faint or none.*—Organisms insignificant in number. or none, 89; organisms numerous, 227.

"II. *Odors pronounced.*—Organisms insignificant in number, or none, 0; organisms numerous, 184.

"The fact that, in 227 cases in 500, odors were practically absent, but organisms were present in considerable numbers, bears directly on the question of the origin of odors. If the odors were due to excretions, then one must explain the absence of odors in the 227 cases mentioned, either by supposing that, at the time of collection and examination, these organisms produced no excretions or that their excretions were inodorous. The former supposition is not probable, because the physiological processes of nutrition, excretion, etc., in a plant, go on with such regularity that interruptions such as this supposition demands are exceptional, if, indeed they occur at all. The second supposition, namely, that the excretions were inodorous, is improbable, because, in one instance or another of the 227 cases cited, almost all of the important organisms which occur in potable water have been present. Consequently, it cannot be maintained that the great number of organisms which these cases present is made up of only a few kinds of organisms, the excretions of which might be inodorous." This fact is emphasized by a table of fifteen of the more important organisms, including asterionella and the three others mentioned by Prof. Leeds, and the number of times when they were present in great numbers.

"The table is constructed from 100 representatives of the 227 examinations previously cited.

"Two conclusions can be drawn from these observations: First, *any* of the more important organisms can be abundantly represented in a water and yet the water can be odorless; and, second, the same kind of organisms in other instances appear to be the sole cause of disagreeable odors. Any attempt to explain these odors as excretions from the organisms necessitates a belief either in a temporary cessation of the function of excretion or an alteration in the character of its products; two changes which are decidedly improbable. If, then, the odors are not the products of excretion, they must result from the decomposition of dead organisms. That this conclusion is true is probable from the fact that the odors noticed in various waters are so generally similar, presenting by no means a diversity equal to the number of kinds of organisms."

However, it is sincerely to be hoped that the effort to circumvent the living asterionella, to which Prof. Leeds attributes the foul

odor of Brooklyn's water supply, will be equally efficacious, on account of the opportunity it will afford, in cleansing the reservoirs from the twenty years' accumulation of dead organisms, ever subject to decomposition and foul odor under favorable temperature.

THE SANITARY MAUSOLEUM SYSTEM, for the disposal of the dead, recently approved of by the Health Department of New York, was fully described and approved of in THE SANITARIAN nine years ago. Indeed, the process was first suggested in a paper on the "Disposal of the Dead," by George Bayles, M. D., published in THE SANITARIAN twenty-three years ago, Vol. II., p. 97. Writing on the grave-yard pollution of the New York water supply nine years ago (Vol. XXI), which still obtains, we took occasion to describe the plan of "The New Mausoleum Structure," submitted to us by the then recently organized Mausoleum Company, and said of it: "The proposed system appears to be thoroughly practicable; it is certainly a great improvement upon the insecure vaults common to most of our cemeteries; it protects against theft; overcomes the medico-legal objection to cremation—the destruction of evidence of crime—and meets the sentimental deference to the dead. And, it should suffice to state, it meets the sanitary demand—*that the dead shall not become a perpetual source of danger to the living.* We subsequently witnessed, from time to time, the process and results of dessicating experiments by the Company, on the dead body. What we witnessed and what we have been able to learn since, of the system and the plans for carrying it out, have strengthened our impressions more and more with regard to the practicability and sanitary advantages of the sytem.

DIPHTHERIA FROM CHEWING GUM.—The Westchester (Pa.), Local News, of June 26, publishes an account of the spread of diphtheria in a family as follows:

The child which was first attacked by the dread disease is said to have been a pupil in the room of the public school where a large number of cases originated and it carried the germs to its home. While this child was suffering from the first symptoms of the disease it was given a cent by its parents and spent the money for chewing gum. The stuff was masticated by it for a time and then transferred in turn to the mouths of the other children in the family. The result was that this direct contact of the germs of the disease showed its effect at once and all of the four children were stricken about the same time.

STIMULUS TO INTELLECTUAL WORK.—Dr. Toulouse, the Parisian authority on Zola, hysteria, genius and a few other things more

or less complex, pronounces the reassuring opinion that though a diseased nervous system may sometimes facilitate artistic creations, its general result is brutally to fetter the workings of genius. For this reason he condemns all the artificial stimulants of the day, including spirits, absinthe, morphine, antipyrine, chloral, bromide and the like. He quotes also, but only to denounce, the unnatural postures which some great writers have assumed to lighten the travail of the brain. Of Rousseau, who worked with his head in the sun; of Schiller writing with his feet in ice; of Cardau biting his lips and arms, he has only to say that laughter is lost in grief and pity. His final advice is to fly "la névropathie," and hysteria, that climbing madness, with their effects and causes. "Seek your stimulus in regular work," he says. Stimulus but not stimulants would seem to be his motto.

OUT OF TOWN.

Now doth the city idiot his pleasant home desert,
He wanders off to some old lake, and dons a flannel shirt,
There, in apartments two by four, he tries to take his ease,
While fighting animalculae, mosquitoes, bugs and fleas.
He hasn't room to take his breath, but yet he tries to smile.
In a sickly, sentimental way, for that's the proper style;
"How is the climate?" some one asks. "Well," he says, "as a rule,
Although the days are pretty warm, the nights are always cool."

He wanders up and down the beach, reciting poems and such,
And looks down on the other chumps as if they weren't much;
He talks of boats and rigging and the larboard and the lee,
As if he would impress folk that he'd sometime been to sea,
He hitches up his trousers like a sailor on the stage,
And prattles to small schoolgirls of a very tender age;
If some one says, "How hot it is!" he shouts, "You goldarned fool!
Although the days are pretty warm, the nights are always cool."

—St. Paul Dispatch.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrams, M. D., Health Officer, reports May: Deaths, 68—21 under five years of age. From consumption, 6; annual death rate, 21.36.

Dallas County, 48,432. J. A. McKinnon, M. D., Registrar (Selma), reports for April: Deaths, 31, death rate per 1,000, 7.24.

Selma, 7,622. John M. McKinnon, M. D., Registrar, reports for June: Deaths, 13—4 under five years of age. Death rate, white, 27.44; colored, 14.55; 20.99.

Birmingham, 27,178 (News), July 8: Reports from the Board of Health furnish evidence of the continued good health of the city. The figures show that the number of deaths from December 1, 1895, to June 1, 1896 (six months) was 291 or 17 1-7 per 1,000 of population per annum, while from December 1, 1896, to June 1, 1897, the number of deaths was 239, or 13 2-3 per 1,000 population per annum, thus showing a great improvement in the sanitary condition of the city over last year. Statistics show absolutely that Birmingham is one of the most healthful of American cities. The proportion of deaths among the colored people of the city is nearly double that of the whites. It is shown by the records of the Board of Health that some years the death rate among the whites of the city is only 4 to 7 per 1,000 per annum and only one or two cities in America can make a like showing. These deaths include those caused by accident as well as disease, and in a great railroad centre, in a mining district, this cause prevails to a large percentage.

The general sanitary condition of the city is excellent.

CALIFORNIA.—C. A. Ruggles, M. D., President, Stockton; W. P. Matthews, M. D., Secretary, Sacramento.

The Secretary reports that twenty-eight cities, towns, villages, and sanitary districts, aggregating a population of 680,891, show a mortality of 682—a death rate of 13.44 per thousand per annum.

There were 122 from consumption, 49 from pneumonia, 24 from bronchitis, 3 from congestion of the lungs, 4 from diarrhoea, 5 from cholera infantum, 36 from other diseases of the stomach and bowels, 10 from diphtheria (and croup), 1 from scarlatina, 4 from whooping cough 1 from typho-malarial fever, 7 from typhoid fever,

1 from remittent and intermittent fever, 3 from cerebro-spinal fever, 32 from cancer, 88 from heart disease, 4 from alcoholism, and 288 from all other causes, three of which were from la grippe.

Reports from twenty-two localities outside of the larger cities and towns give 13 cases of pneumonia, 79 cases of bronchitis, 9 cases of pleurisy, 8 cases of congestion of the lungs, 72 cases of diarrhoea, 117 cases of dysentery, 30 cases of cholera morbus, 24 cases of cholera infantum, 4 cases of diphtheria, 14 cases of croup, 3 cases of scarlatina, 35 cases of measles, 54 cases of whooping cough, 56 cases of la grippe, 2 cases of typhoid fever, 118 cases of malarial fever, 1 case of cerebro-spinal fever, 7 cases of erysipelas, 60 cases of rheumatism, 56 cases of neuralgia, 50 cases of tonsilitis, 52 cases of pharyngitis, and 12 cases of mumps. Measles were reported epidemic at Fresno and Cottonwood. Whooping cough was reported epidemic at Madera, Fresno and Downey. Mumps were epidemic at Selma.

San Francisco, 360,000. Reports for May: Deaths, 465—92 under five years of age. From consumption, 83; acute pulmonary diseases, 60; from zymotic diseases, 31; diphtheria (and croup), 9; typhoid fever, 3. Annual death rate, 15.4. Contagious diseases reported during the month: Diphtheria, 17; scarlatina, 13; measles, 22.

The conflict of the quarantine authorities continues. At the present time (Call, July 4), arriving vessels undergo thorough inspection by both the Federal and State authorities, and the latter charge a fee in proportion to the tonnage of the vessel. It seems that when a ship arrives in San Francisco from a foreign port Dr. Rosenau, the Federal Quarantine Officer, appointed by the President, boards the vessel and makes a thorough investigation. Then the local Quarantine Officer, Dr. Chalmers, who is appointed by the Board of Health of this city under a State law bearing on the subject, makes an inspection, but the permission of the Federal officer is the only one that is recognized by the Collector of the Port.

A suit is now pending by the Health Officer of the Board of Health for $7.50 against Welsh & Co., owners of the bark R. P. Rithet, in order to make a test case and have the proper courts furnish a decision, in order that the future actions of the officials may be conducted legally.

Los Angeles, 107,000. Reports for May: Deaths, 116. From phthisis, 22; acute pulmonary diseases, 9. Annual death rate, 13.56. "N. B.—Of the 22 deaths from pulmonary consump-

tion, as follows: Natives of Los Angeles, 1; natives of the Pacific Coast outside of Los Angeles, 0; from other parts, 21 (of the 22 deaths 15 had lived here less than ten years)."

COLORADO.—Denver, 160,000. William P. Munn, M. D., Health Commissioner, reports for May: Deaths, 138. Of these 30 were caused by consumption, 28 contracted elsewhere; 11 by acute pulmonary diseases; 1 by measles; 3 by whooping cough. Annual death rate, 10.35 (excluding phthisis contracted elsewhere), 8.25.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven. The Secretary's bulletin for June comprises reports from 165 towns in the State, with an aggregate population of 878,992, from which the number of deaths reported for the month was 978—275 under five years of age. The death rate for the larger towns is 13.8; for the smaller, 11.6, and for the whole State, 13.3. Deaths from zymotic diseases, 164—16.7 per cent. of the total mortality; from consumption, 99.

Cases of infectious diseases reported: Measles, 253; scarlatina, 148; diphtheria and croup, 100; whooping cough, 62; typhoid fever, 22.

DISTRICT OF COLUMBIA, 275,000—87,900 colored.—Wm. C. Woodward, M. D., Health Officer, reports the mortality for three weeks ending June 26, as 318. Of the decedents 172 were white and 146 colored, the death rate being 15.3 for the white, 28.4 for the colored, and 19.6 for the whole population. The principal causes of death were diseases of the circulatory organs, 31 deaths; of the kidneys, 21 deaths, and of the respiratory organs, 53 deaths, of which 32 were from consumption and 15 from pneumonia. Of the zymotic class there were 8 fatal cases of diphtheria, 5 of typhoid fever, and 16 of whooping cough.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Tampa (Jacksonville Citizen), July 1.—Assistant Surgeon General Winn of the Marine Hospital service and A. H. Glennar of the St. Louis Hospital, are here to confer with State Health Officer Porter about protecting the Florida Coast from infectious diseases. The result will be that the National and State Boards of Health will unite at once and place a police patrol along the Florida Coast from Key West to Charlotte Harbor and up to Anclote, using small

launches, and a most vigorous effort will be made to keep out all vessels from other countries. The recent appearance of smallpox at Fort Meade has caused this extra effort, as it has been demonstrated how easily the disease could come into the State.

Pensacola, 15,000. B. R. Pitt, President of the Board of Health, reports for June, deaths, 19. Under five years of age, 5. Death rate, 15.2.

ILLINOIS.—L. Adelsberger, M. D., President, Waterloo; J. A. Egan, M. D., Secretary, Springfield.

Chicago, 1,619,226. A. R. Reynolds, M. D., Commissioner, Report for May: Deaths, 1,702—568 under five years of age. From diphtheria, 163; typhoid fever, 13; consumption, 212; pneumonia, 209; bronchitis, 76; measles, 11. Annual death rate, 13.91.

Twenty thousand cubic yards of river refuse are being dumped into Chicago's drinking water every 24 hours in violation of the State law.

This was the substance of a communication sent to Mayor Harrison by Health Inspector Reynolds this morning (Chicago Journal, June 21). The mayor, as chief executive, was asked to call on the harbormaster and see that the laws be enforced for the protection of the health of citizens.

Dr. Reynolds' report says the dredgings taken by the United States government authorities from the bed of the river are being deposited less than a mile and a half from the shore and in dangerous proximity to the Chicago avenue intake. He says his inspectors inform him that 25 scow loads a day are hauled out into the harbor, and that the tests of water show an increasing pollution at the Chicago avenue crib.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

State Board of Health report for the last quarter (Indianapolis Journal, July 11). 4,255 deaths from all causes, 577 from phthisis, 587 from pneumonia, from membranous croup and diphtheria 213 deaths out of 580 cases were reported, 12 deaths out of 316 cases of scarlet fever, 91 deaths out of 95 cases of typhoid fever, and 47 deaths out of 4,093 cases of measles. The total number of deaths shows an increase of 366 over the preceding quarter.

A table of deaths from all causes in the report shows that Marion County, with a census population of 141,000, leads the counties of

the State. In this county there were, from all causes, 586 deaths, or four and a fraction to the thousand inhabitants.

Hog cholera and typhoid fever statistics as follows are given:

"Five hundred thousand hogs die of hog cholera annually in Indiana. Loss involved, at least $5,000,000. Hog cholera can't be cured with any measure of success; it can, however, be prevented by cleanliness.

"Typhoid fever attacks over 20,000 persons in Indiana every year; 1,600 died from the disease in 1896. Loss, over $5,000,000. Typhoid fever can be prevented by cleanliness. Why not effect both these savings?

"The loss of the hogs is almost entirely pecuniary. The loss of the human beings is also pecuniary, and is attended with oceans of anxiety, sorrow, suffering, widowhood, orphanage, and not a little insanity. There will be much good politics in saving the hogs. There will be little politics in saving the people, but there will be a great deal of humanity and Christianity. Much difficulty will be met in trying to prevent hog cholera and typhoid fever. A farmer said to the writer, after the road to hog cholera prevention had been pointed out: 'Well, I don't think I'll favor it. If we were to save all the hogs, or even a portion, that die of cholera, the markets would be glutted and the price would go down below the cost of production.' A State senator said to the writer, after the road to typhoid fever prevention had been pointed out: 'Lookee here, now, don't you know we have lots of people who ought to die?' The S. S. was not joking."

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board Bulletin for June, reports since preceding: Diphtheria, 8 localities; scarlatina in 1; measles in 1; typhoid fever in 1.

Davenport, 35,000. W. L. Allen, M. D., Physician to Board of Health, reports for May, 37 deaths—4 under 5 years of age. Zymotic diseases caused 3 deaths; consumption, 2; pneumonia, 4.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored. Deaths in May, 590; colored, 214; 218 under five years of age, 66 colored. Deaths from consumption, 75; pneumonia, 31; bronchitis, 11; influenza, 1; diphtheria, 3. Death rates—White, 23.14; colored, 32.10: 27.62.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M.D., Health Commissioner, reports for May. The weather: The mean barometric pressure during May was 29.97 inches; mean temperature 63°; total precipitation 6.88 inches, an excess in precipitation during the month of 3.10 inches; prevailing direction of wind northwest.

Mortality 686, an increase of 28 compared with the corresponding month of May, 1896. Of these 505 were whites and 181 colored; a death rate of 14.06 per thousand for the former and 30.30 per thousand for the latter. The death rate per thousand for the whole population was 16.22. 39 died from infectious diseases, 98 from consumption, 67 from pneumonia, 9 from enteritis, 18 from bronchitis, 17 from Bright's disease, 33 from nephritis, 7 from cholera infantum, 15 from apoplexy, 6 from typhoid fever and 7 from gastroenteritis. 222 or 32.26 per cent. of the total deaths were in children under five years of age.

Cases of infectious diseases reported during the month of May, 313; a decrease of 47 compared with the preceding month.

Deaths in public institutions, 107; of which twenty-eight were reported as non-residents.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083. Samuel H. Durgin, M. D., Chairman of Board of Health.

During the month of May there were 964 deaths, of which number 94 were under five years of age. Annual death rate, 22.40 per 1,000. Deaths from diphtheria (and croup), 52; scarlatina, 23; typhoid fever, 8; cerebro-spinal meningitis, 50; influenza, 4; consumption, 102. Cases reported: Diphtheria, 340; scarlatina, 332; measles, 781; typhoid fever, 21; smallpox, 10.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

State Board report not received.

Detroit, 275,000. S. P. Duffield, M.D., Health Officer, reports for April: Total mortality 389—96 under five years of age. Annual death rate, 17.21 per 1,000. Consumption, 30; pneumonia, 57;

diphtheria, 24; measles, 10;. Infectious diseases reported: Diphtheria, 71; scarlatina, 30; measles, 17.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602.—H. N. Avery, M. D., Commissioner, reports for May: Deaths, 142—26 under five years of age. Deaths: Consumption, 29; typhoid fever, 15. Annual death rate, 8.51.

St. Paul, 215,582.—A. J. Stone, M. D., Commissioner. Mortality for May, 91—27 under five years of age. Deaths from typhoid fever, 1; diphtheria, 1; consumption, 11; pneumonia, 7. Annual death rate, 5.06.

MISSISSIPPI.—Jackson (Times-Democrat, New Orleans, La.), July 9.—The executive committee of the State Board of Health at a meeting in this city decided to run the quarantine station just as has been done in previous years. The trouble between the State officers and those of Uncle Sam has been settled satisfactorily to both parties, and there will be no more clash of authority.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for May: Deaths, 746—197 under five years of age; from zymotic diseases, 79; diphtheria, 15; whooping cough, 8; typhoid fever, 7; phthisis, 85; pneumonia, 102. Annual death rate, 14.9.

Kansas City, 165,000.—E. Von Quast, M. D., Health Officer, reports for May: Deaths, 180—47 under five years of age. Deaths from diphtheria, 1; typhoid fever, 1; phthisis, 7; tuberculosis, 13; pneumonia, 14. Annual death rate, 13.0.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

The second meeting of the New Hampshire Association of Boards of Health, was held in the senate chamber at the State House, July 12th.

"Public Rights versus Personal Liberty in Health Affairs," was the subject of a paper by Prof. Robert Fletcher of Hanover, member of the State Board of Health, in which he dwelt in particular upon the importance of pure water supplies, and needful measures for the supply of pure milk. The relation of sanitary science and civil engineering was shown to be a very important question, and the public ownership of public works was considered in various bearings.

"The relation of public rights to sanitation in this State," he said, "are already well secured by adequate laws relating to abatement of neighborhood nuisances, infectious diseases, direct pollution of water supply, special examination of suspected water in certain cases, improvement of swamp lands for the public benefit, quarantine on our borders, and in relation to railroad transportation and cattle inspection so far as the means granted will allow.

"We have seen that the purity of our water supplies as to danger of infection from beyond the immediate surroundings and the purity of our dairy products, are not yet sufficiently guarded. We can now take satisfaction in the improvement in the constitution of local Boards of Health, which secures uniformity of appointment and a three-year tenure of office for each member.

"We have proposed that such boards of health shall have jurisdiction as inspectors, with power of reasonable action in emergencies, in all cases where there is manifest danger to the public from conditions which threaten the purity of any source of water-supply, or which are liable to infect dairy products.

"We propose that the law shall prescribe such co-operation between local boards of health and the cattle commission that the latter may be promptly notified by any dairy premises where cattle disease is known to exist, or kept in such condition that the existence of disease may be fairly presumed, and that action in any case shall not be delayed.

"We propose that the State shall take proper action to prevent the systematic discharge of the waste from mills, factories and villages which are, or may become, sources of water-supply.

"We also urge the need of better appreciation of the value of bacterial analysis of water or milk, against which there is a fair presumption of infection, and that the State Board of Health have authority and means to employ a skilled bacteriologist to make all necessary examinations in such cases.

"We urge that the local Board of Health be prompted to take such wise action, gentle or stern, according to circumstances, as shall rescue from the omnipresent expectorator the public right to neat sidewalks and clean floors in our railway cars.

"Finally, we urge that the local boards of health be allowed such amount of discretion and compensation, without unreasonable restriction, as shall make it possible for them to devote to their duties time and attention commensurate with their responsibilities, and which shall secure to their respective towns the full measure of service which the public ought to have."

The subjects presented in this address were the chief topics of discussion. Dr. G. P. Conn gave an entertaining description of a visit made by him to a milk farm in Aiken, S. C., where the greatest care was exercised in the feeding, milking, and handling of the product. The result was that patrons of the hotels there visited the farm daily and drank the milk much the same as Germans go to the beer gardens to get their beer.

Professor Fletcher closed the discussion, emphasizing the necessity of good water supplies and pure food, and the advisability of securing expert advice in the preparation and carrying out of plans for public works, such as water and sewerage systems, etc. In planning water supplies, the question of sewage disposal should also be considered, and the plans for both should be consistent. The work should be laid out right, and then if the means are not at hand to carry out the plans, in their entirety, let the work be carried on as fast as the appropriations will permit.

Fred. W. Morse, B. S., professor of chemistry at the New Hampshire College of Agriculture and the Mechanic Arts, gave a paper on "The Farmer's Water Supply." He said, in part:

"Provided with the best of water by nature, man too often supplies himself and his family with a liquid nearly as vile as that flowing in a city's sewers and as deadly as the poisonous draughts of story. This is not done wilfully but through ignorance and carelessness and, and is apt to occur on the farm as in the town.

"In order clearly to understand the way in which a well becomes contaminated by its surroundings we must consider whence comes the water which fills it. All ground water comes primarily from the atmosphere in the form of rain and exists throughout the soil; but does not usually saturate it for some distance below the surface. The level of saturation or standing-water is known as the water-table. A well is a hole dug deep enough to penetrate the water-table.

"Whatever water percolates to the water-table carries with it an amount of material in solution dependent upon the quality of soluble substances with which it comes in contact. The best indicator of this material in solution is the chlorine. Lime is also an important constituent of sewage matter. Purification of water is accomplished by what are known as nitrifying organisms in the soil."

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Paterson, 106,248.—J. L. Leal, M. D., Health Officer, reports for May: 112 deaths—41 under five years of age. Annual death rate, 10.5. Deaths from diphtheria, 7; consumption, 14; pneumonia, 7.

Newark, 230,000.—Health Officer Chandler reports for the four weeks ending June 26: Deaths, 262—81 under five years of age; from diphtheria, 5; consumption, 37; pneumonia, 11; other respiratory diseases, 26. Annual death rate, 14.8.

Hudson County (Jersey City and vicinity), 355,231.—W. W. Varick, M. D., President.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for May reports that there were 1,000 fewer deaths reported during the month than in the month preceding, the total number for the State being 9,266, a daily average of 300, against 344 in April and 373 in March. The death rate has decreased from 19.00 per thousand population to 17.00. This decrease is almost identical with that of the corresponding months of 1896, and also of 1895, and for the past ten years the average diminution in mortality from April to May has been not less than 800. The death rate in May, 1896, was 17.50. The zymotic mortality is the same as that of the preceding month, with no material variation in any of the respective zymotic diseases; it is less than that of a year ago. The number of deaths under five years of age (2,470), is less by 350 than either of the months compared, and is unusually small, constituting 27.0 per cent. of the total mortality and an annual death rate of 4.5 per 1,000 population. Acute respiratory diseases caused 500 fewer deaths than in April, and there was a lessened mortality from nervous diseases, old age, and from unclassified causes. Grippe is estimated not to have materially impressed the mortality of the month. Smallpox does not exist in the State outside the metropolis, where, as in April, 7 deaths occurred from it. Scarlet fever caused 1.6 per cent. of the deaths of the Maritime district and 1.0 per cent. of the entire mortality. Diphtheria caused 4.0 of all deaths and nearly 6.0 of those in the Maritime district, in rural parts of the State causing about 1.0 per cent. One death from rabies is reported from Long Island City. The relative mortality from acute respiratory diseases in rural districts to the rest of the State was as 12 to 15, and of consumption as 9 to 12, while from zymotic diseases it was as 6 to 12. The mean barometer for the month was 29.96, the relative humidity somewhat high

and the dew point low; the temperature below normal with higher ranges through the central part of the State; one-third of the days were clear, the rainfall excessive in the east and deficient centrally, the winds being variable but generally westerly, the total movement being normal.

New York City, 1,995,000.—Report for May: Deaths, 3,158—1,138 under five years of age. Death rate, 18.45. Zymotic diseases, per 1,000 from all causes, 136.70; diphtheria, 195; typhoid fever, 14; cerebro-spinal fever, 31; consumption, 381; acute respiratory diseases, 504; diarrhoeal diseases, 44.

Brooklyn, 1,100,000. Report for May: Deaths, 1,528—511 under five years. Death rate, 16.2. From zymotic diseases, per 1,000, from all causes, 123.10; diphtheria, 94; typhoid fever, 8; consumption, 181; acute respiratory diseases, 256.

Referring to the reduction of the death rate in New York, Deputy Health Commission Wyckoff of Brooklyn, has furnished (the Sun, July 11), this comparative table of the death rate in that city and in New York for the last eight years:

	Brooklyn.	New York.		Brooklyn.	New York.
1890	22.1	26.0	1894	19.0	23.8
1891	23.5	27.1	1895	19.7	23.8
1892	21.6	26.9	1896	19.8	22.3
1893	21.6	26.9	1897	17.2	19.6

Upon which the Sun remarks: "The conclusion to be drawn from the foregoing is reasonably this, that the death rate figures given in both cities, while correct as accurate and authentic records, fail to show any greater healthfulness in one city than in the other. Both are healthful, and the happiness and likewise the healthfulness of both towns will be promoted by the great event of Jan. 1, 1898.

Buffalo, 350,000. Report for May: Deaths, 340—85 under five years. Death rate, 11.6. From zymotic diseases, per 1,000 deaths, from all cauess, 110.0; diphtheria, 9; acute respiratory diseases, 58; consumption, 38; typhoid fever, 5.

Rochester, 170,000. Report for May: Deaths, 171—25 under five years. Death rate, 13.1. From zymotic diseases, per 1,000 deaths from all causes, 118.0; consumption, 21; acute respiratory diseases, 25.

Albany, 100,000. Report for May: Deaths, 143—30 under five years. Death rate, 17.1. From zymotic diseases, per 1,000 deaths from all causes, 75.0; typhoid fever, 3; diphtheria, 4; consumption, 28; acute lung diseases, 18.

Middletown (Press, June 26), appears to have had an epidemic of typhoid fever. At a special meeting of the Board of Health, June 25, seventeen cases were reported. In view of these cases, and for the prevention of new cases, the Board recommended that all water and milk used for drinking or culinary purposes should be boiled. But the condition of the water supply was not reported upon.

NORTH CAROLINA.—George G. Thomas, M. D., President, Wilmington; Richard H. Lewis, M. D., Secretary, Raleigh.

June Bulletin summarizes reports from towns, with an aggregate population of 61,467 white and 45,817 colored, for the month of May: Deaths, 54 white, 89 colored—60 under five years of age. Death rates, respectively, 115; 23.3; 16.5. The chief causes were: From consumption, 22—19 colored; pneumonia, 7—6 colored; heart disease, 10; brain diseases, 10.

Mean barometer 30.02 inches; normal for May 30.04. Highest 30.37 on the 8th at Hatteras. Lowest 29.54 on the 1st at Raleigh. Mean temperature 64.6 degrees; normal for May 67.0. Highest temperature 92 on the 24th at Goldsboro and other points. Lowest temperature 28 on the 2d at Highlands. Average rainfall 3.73 inches; normal for May 4.25 inches. Greatest monthly rainfall was 6.98 inches at Chapel Hill; least monthly rainfall was .99 inches at Waynesville. Average number of clear days 14; partly cloudy 10; cloudy 7; rainy 9. Prevailing wind direction southwest. Average hourly velocity 8.8 miles. Normal direction for May southwest; normal velocity 7.8 miles per hour.

The Annual Meeting of the Board was held, in conjunction with the State Medical society, June 9. The term of office of all the members of the board expiring at this meeting, his excellency, Governor Russel, appointed Drs. C. J. O'Hagan of Greenville, J. D. Spicer of Goldsboro, J. L. Nicholson of Richlands, Col. A. W. Shaffer, Civil Engineer of Raleigh, and re-appointed the present Secretary.

Drs. George G. Thomas of Wilmington, S. Westray Battle of Asheville, W. H. Harrell of Williamston and John Whitehead of Salisbury, were re-elected.

Drs. Geo. G. Thomas and Richard H. Lewis were unanimously re-elected President and Secretary respectively. A chemical and a bacteriological examination of all municipal water supplies in the State was ordered, and the Engineer of the Board was appointed to collect, pack and ship the samples, and at the same time to inspect the works and water-sheds, and make report thereon.

The Secretary's annual report was read. Particular referenc was made to measles and the difficulty of restricting the disease o account of the popular sentiment among the country people that was a common condition of childhood and useless to try to preven it. Action was taken with reference to the necessary course in th collection and transporting samples of ice and water to the bacteri- ologist, and on other matters of detail promotive of sanitary cer- tainty.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cases of and deaths from infectious diseases reported to the State Board of Health during the four weeks ending May 29, 1897: Diphtheria, 144 cases, 36 deaths; scarlatina, 146 cases, 3 deaths; typhoid fever, 109 cases, 23 deaths; whooping cough, 65 cases, 6 deaths; measles, 154 cases, 7 deaths. Aggregate population represented, 1,329,643.

Cincinnati, 405,000. J. M. Withrow, M. D., Health Officer, reports for May, 409 deaths—126 under five years of age. Annual death rate, 12.11. From consumption, 46; pneumonia, 37; bronchitis, 16; zymotic diseases, 52; diphtheria, 14; typhoid fever, 10.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports for the year 1896: Total mortality, 4,859, a decrease of 308 as compared with 1895, giving a death rate of 14.68 per 1,000. The deaths under five years numbered 2,056. There were 693 cases of diphtheria reported and 177 deaths; 971 cases of measles and 7 deaths; 296 cases of typhoid fever and 147 deaths. Deaths from consumption, 1,265; pneumonia, 393.

During the month of May: Deaths, 377—128 under five years. From diphtheria, 12; typhoid fever, 6; consumption, 28; tuberculosis, 25; pneumonia, 40; bronchitis, 6. Death rate, 12.92.

Toledo, 137,780. June 19.—J. T. Woods, M. D., Health Officer, issued a smallpox bulletin, as follows: Total number of smallpox cases to date, 17; varioloid, 1; total recovered, 8; total deaths, 3; convalescent, 4; remaining under treatment, 3; total number quarantined to date (not patients), 52; discharged from quarantine (not patients), 37; remaining in quarantine (not patients), 15. No new cases, except the mild case of varioloid, for 15 days.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,214,256. Theodore B. Stulb, Health Officer, reports for four weeks ending June 26: Deaths, 1,572—607 under five years of age. From diphtheria, 116; typhoid fever, 20; consumption, 161; pneumonia, 144.

There has been received quite recently (American, July 5), at the office of the Bureau of Health at the City Hall, a complaint regarding milkmen of this city, which places them in an unenviable light before the great body of consumers in this community, and which shows them to be filthy almost beyond belief. In this hot weather, when the Bureau is straining every point in the way of sanitary precaution to keep away pests and prevent the introduction of plagues in this country, the news that milkmen are not only careless in their methods of sanitation, but actually guilty of positive filth in the handling of their commodity, will startle many.

And yet it is so. The Milk Inspector intimated that there were places where the cans actually created a stench, and, it required every effort to keep the practice down.

"As situated at present," he declared, "the force at my command is entirely inadequate to the task. It is impossible for us to cover the ground, which takes in the whole county, and were it not for communications such as these there are milkmen who might never be reached."

Chief Brynes intimated that there might be developments later, when some of the milkmen who are known to be violating the laws of sanitation in this respect would be called to account.

Pittsburg, 285,000. Report for the four weeks ending June 26: Deaths, 313—128 under five years of age; typhoid fever, 9; consumption, 25; diphtheria, 3. Death rate, 14.10.

Scranton, 83,450. Secretary Briggs reported (Truth, July 8), that there were 166 deaths in June, 114 births, 55 marriages. Of 154 contagious diseases reported, 56 were diphtheria, 86 measles and 12 scarlet fever. There were 10 deaths from diphtheria, 2 from measles.

The board was reorganized for the ensuing year by the re-election of Dr. Wm. A. Paine, President, Dr. William E. Allen, Health Officer; the election of R. I. Murray, Secretary, and Henry Loftus, Superintendent of the Crematory.

Diphtheria is reported prevalent in Hollywood and Altoona.

South Carolina.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for three

weeks ending June 26: Deaths, 107—66 colored. Under five years of age, 46. Annual death rate—white, 24.6; colored, 31.5: 28.1.

TENNESSEE.—J. A. Albright, M. D., President, Somerville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin for June reports: The principal diseases named in the order of their greater prevalence in the State, for the month of May, were: Malarial fever, measles, typhoid fever, lung diseases acute, dysentery, diarrhoea, consumption, whooping cough, diphtheria, la grippe, scarlet fever, mumps, chickenpox and smallpox.

TEXAS.—San Antonio, 36,673. The City Physician reports (Light). June 20, for the fiscal year ending May 31, 1897: Mortality during the year, 1,160, a decrease of thirty-one on the previous year and exactly the same number as in 1890, while the population has increased. The cause of the decrease, it is surmised, is likely due to the fewer number of strangers, mostly consumptives, during the year, than formerly. The record shows 311 strangers died in 1897 against 352 in 1896. There were 849 residents who died in the year.

UTAH.—Salt Lake City, 48,076. W. T. Dalby, M. D., Commissioner, reports for May: 38 deaths—8 under five years of age. Annual death rate per 1,000, 6.51. From consumption, 3; pneumonia, 3.

VERMONT (Argus, Montpelier), July 7: Diphtheria is again taking a prominent part in the village of Northfield, and the situation is now such that a visit from the State Board of Health is suggested to see if there cannot be found some way of checking the dread disease, which has been prevalent in town for nearly three months, and seems to be slowly but steadily gaining ground. Health Officer Judkins, backed by the Board of Trustees, has done all in his power to maintain the health of the community, but it seems that his efforts have not been attended with success, and in some instances there is a disposition to object to the enforcement of sanitary precautions such as are absolutely necessary if the disease is to be rooted out.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 275,000.—Walter Kempster, M. D., Commissioner of Health, reports for May: Deaths, 240—112 under five years of

age. From diphtheria, 9; measles, 1; consumption, 30. Annual death rate, 12.65 per 1,000.

MORTALITY FROM SUICIDE in thirty American cities during 1895 and 1896, as compiled by Frederick L. Hoffman (Spectator, July 1, 1897), as follows:

New York, 1895, 376; 1896, 380; increase, 4.
Philadelphia, 1895, 95; 1896, 119; increase, 24.
St. Louis, 1895, 134; 1896, 150; increase, 16.
Boston, 1895, 77; 1896, 90; increase, 13.
Baltimore, 1895, 43; 1896, 48; increase, 5.
San Francisco,* 1895, 110; 1896, 148; increase, 38.
Cleveland, 1895, 37; 1896, 44; increase, 7.
Washington,* 1895, 34; 1896, 38; increase, 4.
Milwaukee, 1895, 48; 1896, 58; increase, 10.
Minneapolis, 1895, 24; 1896, 31; increase, 7.
Kansas City,‡ 1895, 36; 1896, 49; increase, 13.
Providence, 1895, 13; 1896, 19; increase, 6.
Lowell, 1895, 7; 1896, 9; increase, 2.
Cambridge, 1895, 4; 1896, 6; increase, 2.
Hartford, 1895, 8; 1896, 13; increase, 5.
Indianapolis, 1895, 11; 1896, 25; increase, 14.
Detroit, 1895, 19; 1896, 21; increase, 2.
Charleston, 1895, . .; 1896, 6; increase, 6.
Portland, 1895, 3; 1896, 11; increase, 8.
New Orleans, 1895, 41; 1896, 57; increase, 16.
Dayton, 1895, 7; 1896, 12; increase, 5.
Lynn, 1895, 5; 1896, 6; increase, 1.
Chicago, 1895, 350; 1896, 331; decrease, 19.
Cincinnati,† 1895, 66; 1896, 61; decrease, 5.
Buffalo, 1895, 27; 1896, 26; decrease, 1.
Pittsburg, 1895, 30; 1896, 27; decrease, 3.
St. Paul, 1895, 24; 1896, 19; decrease, 5.
Jersey City, 1895, 28; 1896, 28; decrease, . .
Worcester, 1895, 8; 1896, 8; decrease, . .
Brooklyn, 1895, 161; 1896, 159; decrease, 2.
Total, 1895, 1,826; 1896, 1,999; increase, 173.

According to this table the number of suicides in the thirty cities under review increased from 1826 in 1895 to 1,999 in 1896, or at the

*Fiscal years ending June 30.
†Estimated for month of March, 1896.
‡Estimated for months of January and February, 1896.

rate of 9.5 per cent. per annum. Since the average annual increase in the population of these cities was only 4.6 per cent. during the period 1889-90, the suicide rate during 1896 would appear to have increased at more than double the normal annual increase in the population. Thirty cities included in this table contained in 1890 a population of 9,372,000 or of 51.3 per cent. of the total urban population of the United States. The table would, therefore, seem to cover a territory sufficiently large to insure a representative rate of increase for the country at large.

The statistics given will materially differ from a certain class of newspaper returns, which are utterly untrustworthy and misleading, due to the fact that such returns as to homicide or suicide are not based on official reports, but on newspaper clippings, which not only include many duplicates but also very likely unsuccessful attempts at suicide and homicide. A similar error underlies newspaper statements in regard to street railway accidents, which prove any accident fatal—for newspaper purposes.

The prevalence and increase in the mortality from suicide is, however, of sufficient importance to demand the most serious consideration on the part of life insurance companies with a tendency towards too much liberality.

THIRTY-FIVE BICYCLE ACCIDENTS was the record for New York in May, as reported by the Sun, which estimates that four out of every five are not reported at all. If so, the full record would be a hundred and seventy-five with the summer just begun. No wonder the bicycle risk is an important factor to the accident companies. A veteran wheelman, who had just left the hospital a few weeks ago after a month's detention, remarked that an accident to a bicyclist is only a question of time—it is sure to come. That is about the size of it.

TO PREVENT THE INTRODUCTION OF YELLOW FEVER FROM CUBA.—Surgeon-Genral Wyman, of the Marine Hospital Service, has addressed a circular letter to all United States consuls in Cuba, as follows:

"In view of the assistance ordered by the government to destitute perons in Cuba, providing for their deportation from the island, great danger is apprehended to the health of our country at large, and especially to Florida; you are therefore requested to issue no permits to persons desiring to leave the island without being satisfied as to their immunity from disease or furnish clean

bills of health to vessels unless every precaution is exercised and the United States rules and regulations are complied with.

"During this summer and fall I will be glad to have any information or suggestion which will be of service in protecting the southern seaboard of the United States from the introduction of yellow fever by irregular communication with Cuba."

Dr. Brunner, the U. S. sanitary officer at Havana, in reply writes: "All persons applying for acclimation certificates going to Key West and Tampa, Fla., when given such certificates are warned against carrying household effects and the objectionable articles enumerated, yet some of these people persist in carrying filthy bed clothing in their trunks, and when found in the inspection, not only the objectioable articles, but the trunk or box containing said articles, are not allowed to go on the steamer."

MORTALITY IN DEMERARA.—Consul Patterson sends from Demerara, April 14, 1897, an article taken from the Daily Chronicle, of that city, reviewing the report of the health officer on the death rate. Consul Patterson adds that he is informed that the death rate in the surrounding villages will increase rather than diminish the percentage.

The article says in part:

"The death rate is still in excess of the birth rate, a state of things which is most serious in view of the urgent need of the colony for population in order to develop its untouched resources. According to the report, in every 1,000 of the population there are two-fifths more deaths than births, the actual excess of deaths over births during the year being 131. The death rate—33.6 per 1,000 for the year—is, as is well known, largely swelled by infant mortality, which is still terribly high. With regard to the genral mortality, it appears that 28 per cent. of the total deaths were due to tuberculosis and diarrhoeal diseases—both largely preventable complaints.

"The health officer urges the necessity for increasing our efforts in sanitary matters. If the cesspool system is not abolished, the city will some day be swept by disease as is Bombay at the present time. It is gratifying to know that since 1873 the death rate has steadily dropped from 54.39 per 1,000 to 33.6, but the decline is not nearly sufficient. Compared with the most overcrowded and unhealthiest towns of the United Kingdom, this rate is high, and it is nearly double the average of the mother country. It may not be considered fair to compare a tropical colony with such a standard, but it is evident that there is ample room for improvement."—Consular Reports, June, 1897.

OBITUARY.

WASHINGTON, D. C., June 29, 1897.

CIRCULAR LETTER ANNOUNCING THE DEATH OF SURGEON W. H. H. HUTTON.

To the Medical Officers of the U. S. Marine Hospital Service:

It is with regret I have to announce to the medical officers of the Service the death, on the 14th of this month, after a lingering illness, of Surgeon William Henry Harrison Hutton.

Surgeon Hutton was born in York, Jefferson County, Ohio, February 28, 1838. At the beginning of the late Civil War he enlisted in Company K, 20th Regiment, Illinois Volunteers. After about a year's service with his regiment he was discharged and re-enlisted in Company D, 104th Illinois Volunteers, in which regiment he served until the spring of 1864, when, in consequence of a wound received at Pittsburg Landing, he was sent to Chicago, Ill., and in a few months recovered sufficiently to be placed in charge of the office of the Desmanes Eye and Ear Hospital under the U. S. Army, where he remained until March 7, 1865, when he was mustered out of the Volunteer Service. By his bravery he won promotion at the battles of Chickamauga and Missionary Ridge.

He attended his first course of medical lectures at the Alabama Medical College, at Mobile, and on March 16th, 1875, was graduated from the Chicago Medical College, Chicago, Ill., receiving from this institution the first prize of the faculty for the best graduating thesis.

He was appointed Assistant Surgeon in the Marine Hospital Service May 8th, 1875, and was promoted to the grade of Surgeon October 20th, 1876. Surgeon Hutton, during his connection with the Marine Hospital Service, served as commanding officer at the following stations: New York, Cincinnati, New Orleans, Detroit, Louisville, Mobile and Baltimore.

In adddition to the above duties he rendered valuable service at Brunswick and Way Cross, Ga., and Camp Perry, Florida, in 1888, in enforcing the quarantine and other measures during the yellow fever epidemic of that year, and again at Brunswick, Ga., during the yellow fever epidemic in 1893. At Camp Perry he installed and was in command of the first detention camp which proved so successful in the management of the epidemic at that time raging in Jacksonville.

He was placed in charge of the quarantine establishment at Sandy Hook, N. J., during the cholera scare in 1892, and later, in the same year, rendered efficient services in the establishment of the quarantine flotilla at Cape Charles. In 1894 he was detailed to inspect the quarantine stations along the Florida coast, and had temporary charge of the Gulf Quarantine during a part of the same year. For thirty-five years Surgeon Hutton has been serving his country in various capacities in war and pestilence, and always with a conscientious devotion to its interests, and with a zeal worthy of emulation. He was ever ready to obey a summons to duty, and oftentimes was a volunteer when epidemics threatened the country.

In his death the Service loses one of its oldest and most efficient officers.

Respectfully yours,

WALTER WYMAN,

Supervising Surgeon-General, M. H. S.

BOOK REVIEWS.

EYE-STRAIN IN HEALTH AND DISEASE. With Special Reference to the Amelioration or Cure of Chronic Nervous Derangements Without the Aid of Drugs. By Ambrose L. Ranney, A. M., M. D., Author of "Lectures on Nervous Diseases," "The Applied Anatomy of the Nervous System," etc., etc.; Late Professor of Nervous Diseases in the Medical Department of the University of Vermont and of Anatomy of the Nervous Sytem in the New York Post-Graduate Medical School, etc. Illustrated with 38 wood cuts. One volume, royal octavo, pages viii-321. Extra cloth, beveled edges, $2.00, net. The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York; 9 Lakeside Building, Chicago.

This is a distinctly modern treatise; a treatise on a but recently recognized cause of nervous disturbances with more or less painful complications, almost wholly lacking diagnosis, and consequently incurable otherwise than by such treatment as that herein described. It is a book of seven chapters, beginning with the Bearings of Eye-Strain upon the Duration of Human Life. The fact is emphasized that it is only within the last ten or a dozen years that the relationship of eye-strain to functional neuroses has been appreci-

ated and studied. The author maintains that any excess of nervous expenditure to one organ over the normal amount which should be furnished is done at the expense of the other organs sooner or later; and, with special reference to eye-strain, attention is invited to the organ of sight as the only one constantly used, except during the hours of sleep. The relation of intensified vision to the nervous system is illustrated by reminding the reader of the well known inability of some persons to look from a height on a waterfall, or over a precipice, without being made dizzy; and of nausea at revolting sights. These conditions are shown to be suggestive of insufficient strength of the organ of vision primarily, or eye-strain, and a probable waning of the resisting power of the nervous system.

The propositions advanced at the end of the first chapter and, for the most part, sustained in the succeeding chapters, are:

"Eye-strain arises chiefly from defects in the refraction of the eye and an imperfect equilibrium in the muscles which move the eyes. These conditions, when present, tend to cause an excessive expenditure of nerve-force by the individual in direct proportion to the amount of defect to be overcome.

"Excessive expenditure of nerve-force on any one organ is commonly made at the expense of some other organ, or, if not, is paid out of the 'reserve' amount of nerve capital possessed by the individual.

"The extent of the drafts thus made upon the 'reserve' capital and the amount of reserve capital are the two factors which can alone determine, in any individual case, how long this state of things can last without causing a 'nervous bankruptcy.'

"The conditions mentioned as those which chiefly tend to cause eye-strain, are transmissible from parent to child; hence they become operative at birth and last until death, unless mechanically or otherwise relieved. They are capable of detection and accurate measurement during life by scientific procedures. Some of the methods employed by oculists, in testing the eye-muscles, are not worthy of perpetuation.

"A condition of exhausted nervous vitality is sure to impair the general health in many ways, and to render the individual more liable to disease than when in full vigor.

"Many of the constitutional diseases which ultimately imperil the lives of their victims, are indirectly the result of a state of low, nervous vitality (a state which is frequently the result of eye-strain,

from well-understood causes that might have been easily recognized and relieved.)

"The so-called 'inherited predisposition' to certain diseases is unquestionably based, in many cases, upon some anomaly of the visual apparatus. I am so well convinced of this fact that I assert it (without fear of contradiction), from carefully gathered statistics.

"The examination of the eye for errors of refraction and accommodation, and a thorough familiarity with the tests lately advocated for the detection of anomalies of the ocular muscles, ought not to be confined exclusively to the practice of the occulist. They are as valuable to the general practitioner as are the physical signs of the chest."

The various tests and processes used for an accurate diagnosis, are clearly described with appropriate illustrations. Altogether, it is a work of much practical utility to general practitioners, even more than to occulists, and above all to those who would be ever ready to detect the need and make use of timely measures for the prevention of the most obstinate class of diseases they are called upon to treat.

THE WEATHER: REPORT OF THE CHIEF OF THE WEATHER BUREAU, 1895-'96. Washington: Government Print.

A quarto volume of three hundred pages, with numerous statistical tables and charts. It opens with a condensed statement on aerial investigations conducted by Prof. Charles F. Martin, in charge of the Instrument Division of the Bureau. His work during the last seven months of the period reported upon, was confined principally to experiments with kites. The results of the work thus far have demonstrated that for readily attaining elevation exceeding, say, 1,000 feet, wind velocities exceeding ten to fifteen miles per hour must prevail. When favorable winds prevail, it has been shown that kites of the improved forms, produced as a result of weather bureau investigations, suffice for reaching elevations of from 3,000 to 7,000 feet, depending somewhat, of course, upon the load carried. There must always be, however, times when upper air observations cannot be obtained by such means. There is yet needed for obtaining observation in the free air something that may be used on each and every occasion and in any locality. Captive balloons prove to be of little value for reaching lofty elevations, on account of the great amount of surface exposed—the balloon being ever liable to be blown far away from the zenith point over its anchorage by even moderate winds. Studies

into the relation between solar magnetism and meteorology have been pursued under the direction of the Bureau by Prof. Frank H. Bigelow. He is of opinion that the atmospheric conditions which culminate in the storms traversing the United States are dependent in part upon the solar energy that reaches the earth in the form of magnetic influence; that there are synchronous fluctuations in the pressures and temperature of the northwestern regions of the American continent, in the neighborhood of the magnetic pole and the auroral belt; that a train of storms (high and low), advance from that quarter eastward, in well-defined tracks; that the position of the tracks and the intensity of the storms change along with the strength of the solar magnetic fluid; that there are many other forces at work to produce storms, such as the general circulation of the atmosphere and the local connection of heat and aqueous vapor, but that the magnetic forces must be included with the others in order to obtain a correct understanding of the mechanicism of cyclones and anti-cyclones. Stability of Climate, Humidity Observations and the relation of humidity to the Spinning of Cotton, Tornadoes, Forecasts and Weather Warnings, Climate and Crop Service, and several other subjects, germane to a facile comprehension of the tabulated records and charts that follow are also succinctly summed up, illustrating the importance and scope of the Bureau.

We are gratified to observe that the purpose for which "Climate and Health" was undertaken, as a separate publication (but discontinued on the issuance of the March number), "to collect the meteorological and hygienic statistics that might be considered by sanitarians and medical climatologists of the greatest correlative importance," will be pursued during the current fiscal year * * * and published in the form of special bulletins.

HIGH ALTITUDES FOR CONSUMPTIVES: Principles or Guides for a Better Selection or Classification of Consumptives Amenable to High Altitude Treatment, and to the Selection of Patients who may be more successfully treated in the environment to which they were accustomed previous to their illness. By Edgar Tussey, M. D., Adjunct Professor of Diseases of the Chest, in the Philadelphia Polyclinic and School for Graduates in Medicine, and Consulting Physician to the Central Branch of the Y. M. C. A. Gymnasium, Philadelphia. 12mo., pp. 150. Price, $1.50. Philadelphia: P. Blakiston, Son & Co.

The title page of this book very fully explains its purpose. It is an admonition to which the altogether too numerous votaries of high altitudes exclusively for consumptives, among physicians, as well as among consumptives themselves, would do well to heed. Moreover it is a practical lesson on recent knowledge of the natural history of tubercle bacilli—the physical conditions under which they are cultivated and the *kind* of people they attack and on whom they are dependent for the propagation of their species regardless of altitude.

THE NATIONAL WASTE UTILIZATION COMPANY of Camden, New Jersey and Philadelphia, Pa. A description of Processes and Apparatus. J. Walter Douglass, President, 914 Walnut Street, Philadelphia; W. S. Richardson, General Manager, 457 Trenton Avenue, Camden, N. J.

An illustrated pamphlet of twenty pages, showing plans and describing apparatus for converting the hair or refuse of skin dressers, such as fleshings and hair from tanneries, into a fertilizing component or agent by dry distillation.

Methods and apparatus for the conversion of garbage and similar matter into fertilizaing agents or components, whereby the garbage is digested by means of quick lime and superheated steam; and in such connection it relates particularly to the construction and arrangement of apparatus therefor.

These apparatus, respectively, as described and attested, are of great practical utility. We take pleasure in commending them to the attention of sanitary authorities and tannery companies.

COMPRESSED AIR AND THE CLAYTON AIR COMPRESSORS. A catalogue of Air Compressors and Compressed Air Appliances.

It contains, in addition to an illustrated description of the features of the Clayton type of Air Compressor, illustrations and lists of sizes of the standard patterns of compressors, and a descriptive article upon the Widening Use of Compressed Air, showing all of the various applications of this power up to date, together with cuts and descriptions of compressed air tools and appliances. It also illustrates and explains the Clayton Air Lift Pumping System, which is achieving remarkable results, as the best known method or raising water from wells by means of compressed air. It also contains data for figuring the loss of pressure due to friction in transmitting compressed air through pipe and the capacity lost by air compressors in operating at various altitudes above the sea level.

CONTEMPORARY LITERATURE.

ADVANCES OF MODERN SCIENCE.

There are some who imagine that the Victorian age has been destructive of the belief in miracles. In reality it, more than any other since the world began has brought home to the average man the stupendous miracle of the world. They call it a materialist age, which has chained the soul of man to inert matter. But almost before the reproach is heard science proclaims that there is no such thing as inert matter, that every atom is alive, and that our mortal bodies are vast composite conglomerations of living organisms, upon whose pitched battles in our veins depend our health or our disease. To take but one instance. Imagine all that we understand by the word microbe, and then recall the fact that the microbe was practically unknown when the Queen came to the throne. In a very special fashion science has revealed to us a new heaven and a new earth, infinitely marvelous, testifying to an understanding so vast that the mind of man cannot by searching find it out. Behind each discovery that advances our knowledge, the infinite unknown indefinitely recedes. We weigh the stars, analyze their composition in the spectroscope; we photograph the moon, and make maps of the canals in Mars. But far more stupendous are the discoveries that have been made not in the infinitely distant abysses of space, but in the infinitesimally small molecules which are all around. Science has sent its Röntgen ray through the darkened veil, and revealed the Invisible, and summoned all men to enjoy it as their inheritance.—From "The Queen's Empire—A Retrospect of Sixty Years," by W. T. Stead, in June Review of Reviews.

WOMAN'S SPHERE.—These considerations lead to the good old dictum that "home is woman's sphere." It seems well-nigh superfluous to enumerate the obvious qualifications of this general statement. Surely no *fin-de-siecle* person would understand it to mean that woman should look upon marriage in itself as the sole desideratum of her existence, or that, failing to marry, she should devote herself to pets and fancy work, and live upon the charity of her male relatives. Surely at this stage of proceedings no one would attempt or desire to limit woman to purely domestic pursuits. It has been reiterated and most abundantly proved that she need not be circumscribed in freedom or opportunity for the sake of binding her to the home; it is not necessary, for Nature will take

care of itself; and it is not expedient, for the more she is allowed to be in herself the greater the gift she can and will bring to the race. Moreover, no one will contend that every woman ought to be a mother, or that an indefinite number of offspring is a wife's chief duty. In a word, marriage, and the bearing and not bearing of children, are individual accidents dependent upon a thousand private considerations. To fulfill the law of womanhood one need not be a mother, but only to be motherly; one need not be a wife, but only to be loyal to the unselfish principle of wifehood; one need not eschew the paths of business or professional life, so only that she recognize hers as the exceptional feminine career, the more normal and significant one lying within the walls of the home.—From "Let us Therewith be Content," by Ellen Coit Elliott, in Appletons' Popular Science Monthly for July.

THE SUNRISE OF THE POOR.

A darkened hut, outlined against the sky,
  A forward-sloping field, some cedar trees,
  Gaunt grasses, stirred by the awakening breeze.
And nearer, where the grayer shadows lie,
Within a small, paled square, one may descry
  The beds wherein the poor first taste of ease,
  Where dewy rose vines shed their spicy lees
Above the dreamless ashes silently
A lonely woman leans there, bent and gray,
  Outlined in part against the shadowed hill,
  In part against the sky, in which the day
Begins to blaze—O earth, so sweet, so still!
  The woman sighs, and draws a long, deep breath:
  It is the call to labor, not to death.

—Robert Burns Wilson in the July Century.

DEAF-MUTE EDUCATION.—The Columbia Institution is unique, not only because it is the only college for the deaf and dumb in the world, but because it is the only institution where individuals acquire a complete education. Its teachings extend from the very rudiments of language in the Kendall School to the post-graduate course of the Gallaudet College. This normal class, open without distinction of sex to advanced students in full possession of their faculties, completes a year's course of deaf and dumb pedagogy. This pedagogic instruction radiates, through its foreign students, an influence that tends toward higher education in India, and which

in the fortieth year of his services to mankind calls President Gallaudet to Great Britain to aid by his wise counsel in the initiation of the first deaf-mute college on European soil.

It must be a gratification to every American that this national institution has not only subserved the interests of the deaf and dumb in America, but that its influences and teachings are widely felt in foreign countries, both theoretically and practically.—From "Higher Deaf-Mute Education in America," by Gen. A. W. Greely, in American Monthly Review of Reviews for July.

EGG-STRUCTURE AND THE HEREDITY OF INSTINCTS, by Prof. Loeb, of the University of Chicago, is the leading article of the July Monist. He explains marvellous inherited acts by simply assuming polar differences of chemical constitution in the egg, and the presence there of heliotropic, chemotropic, etc., capacities.

Dr. Woods Hutchinson's article on the "Value of Pain" is as striking in its homiletic as it is in its scientific point of view. The eloquent author draws some profound ethical conclusions as to the function of pain in life and drives his lessons home with great literary and imaginative power.

MAN AS A MEMBER OF SOCIETY, by the distinguished French Anthropologist, Dr. Paul Topinard, is an exhaustive review of man's development from the crude beginnings of society down to the highest intellectual culture of the present. Dr. Topinard's original and convincing views will be read with delight by all thinkers.

INSECTS DROWNED IN A PLANT'S LEAVES.—There is a quaint plant, and a very pretty one, quite common in the Northern States, that grows in peat-bogs. It has large flowers with an odd, umbrella-like shield in the centre. The shape of this has given it the name of Sidesaddle Flower, but it does not look very much like a side-saddle. The most familiar name for the plant is Pitcher-Plant, and it is sometimes called Huntsman's cup, or Purple Trumpet-Leaf.

This Pitcher-Plant has leaves shaped like open cups, that stand up from the ground in a cluster. They are generally about half full of rain water, in which many insects are drowned. It is probable that these serve as food for the plant. The pitchers are gaily colored—green with dark-red or purple veining, and sometimes purple all over.—"Plants That Feed Upon Insects," by Thomas H. Kearney, Jr., in June St. Nicholas.

IF THEY BUT COULD.

How often we hear discontented ones talk
  Of grand opportunities lost,
And how by the waves of condemnable luck
  They've ever been ruthlessly tossed.
They'll tell in a sort of disconsolate way
  Of laboring always in vain,
And how they would handle the contract if they
  Could live their lives over again.

The man who has failed in his business affairs,
  The prisoner locked in his cell,
The wedded ones battling with family cares,
  All have the same story to tell.
Wherever we go that disconsolate cry
  We hear in a pitiful strain:
"You'd see matters different with me if I
  Could live my life over again."

We should never weep over milk that is spilled,
  But hustle around for some more.
We cannot recall opportunities killed,
  Nor chances blown off from our shore.
This word of advice is the best we can give:
  Don't over the past sit and brood,
But tackle the future, determined to live
  The balance of life as you should.

—The Denver Post.

SOME FACTS ABOUT ANTS, BEES, AND WASPS, in the July number of Appleton's Popular Science Monthly, is an interesting account of these three representatives of the Hymenoptera, a family thus named by Linnaeus because of the curious connections between the wings during flight. The paper hornet (Vespa maculata), whose curious nest is so famous with the schoolboy as a target, is among the individuals described.

THE REVIEW OF REVIEWS signalizes the beginning of a new volume by an expansion of the name of that very successful and widely-read periodical. It has now become the American Monthly Review of Reviews, with particular emphasis on the first two words. It seems likely enough that the public will speedily fall into the way of calling this magazine the American Monthly, for

short. It is announced, however, by the editor, that the full and formal title will retain the words Review of Reviews. The magazine is especially devoted to public affairs and topics of the time, and its presentation of all such matters is conspicuously from the American point of view. Its reviews and condensations from American and foreign periodical literature form a very acceptable part of its monthly bill of fare; but inasmuch as this work of reviewing the periodicals occupies very much less than half of the space of the magazine, it is obvious that the title Review of Reviews comes far short of expressing the full scope of the periodical. As an ordinary designation, the words American Monthly will better fit the facts of the case. Nevertheless a prestige and reputation have been built up by years of hard work under the title Review of Reviews, and it is not intended that the expansion of the name shall result in the sacrifice of any part of the recognition and credit that have accrued to the name as it has stood hitherto. The magazine continues under the editorship of Albert Shaw, and the public is distinctly informed that the expanded title, appearing on the cover for July, "implies not the slightest degree of change in the plans, methods, aims, scope, editorship, management, or control of the magazine."

THE LIVING AGE, for all its fifty-three years of life, was never fresher, more vigorous or more valuable than now. Timely and able articles on the leading questions of the day, papers of interest and value, biographical, historical and scientific, are always to be found within its pages. The following partial contents of recent issues will give a slight idea of its world-wide scope and variety.

"Some Changes in Social Life During the Queen's Reign," by Sir Algernon West; "The Apotheosis of the Novel under Queen Victoria," by Herbert Paul; " 'The Integrity of the Ottoman Empire' as a Diplomatic Formula," by Wemyss Reid and J. Guiness Rogers; "The Statesmen of Spain," by Emilia Pardo Bazan (translated for The Living Age from the Deutsche Revue). "Among the Liars" is the title given to an account of a visit paid to Crete a couple of years ago, and is of interest at this time when the name has become so tragically familiar. Some good short stories and equally good poetry, with the Monthly Supplement devoted to American magazines, extracts from New Books, and a List of the Books of the Month, vindicate the claim of its publishers that The Living Age is a reflection of the world's best thought and literature. $6.00 a year by The Living Age Co., Boston.

AMERICAN MEDICAL ASSOCIATION.

Officers and Delegates elected at the recent meeting for the ensuing year, as follows:

President—Brigadier-General George M. Sternberg, M. D., Surgeon-General, U. S. A.

First Vice-President, J. M. Mathews, Kentucky; second Vice-President, J. L. Thompson, Indiana; third Vice-President, F. W. Wiggin, New York; fourth Vice-President, T. J. Happell, Tennessee.

Treasurer—H. P. Newman, Illinois.

Secretary—William B. Atkinson, Philadelphia. (Permanent).

Assistant Secretary—W. A. Jayne, Colorado.

Librarian—D. J. Webster, Illinois.

Chairman Committee of Arrangements—J. W. Graham, Colorado.

Board of Trustees—J. W. Priestly, Iowa; Joseph Eastman, Indiana; Truman W. Miller, Indiana.

Judicial Council—D. W. Crouse, Iowa; T. D. Crothers, Connecticut; W. T. Bishop, Pennsylvania; R. C. Moore, Nebraska; G. B. Gillespie, Tennessee; C. H. Hughes, Missouri; Ida J. Hieberger, District of Columbia.

Annual Addresses—"General Medicine," J. H. Musser, Pennsylvania; "General Surgery," J. B. Murphy, Illinois; "State Medicine," S. C. Busey, District of Columbia.

Delegates to the International Medical Congress at Moscow, August, 1897—G. S. Mitchell, J. E. Hyndman, Charles Dennison, A. M. Miller, H. L. E. Johnson, George M. Sternberg, D. L. Huntington, A. Marcy, Sr., H. D. Holton, Thomas McDevitt, J. N. Quimby, George R. Fowler.

Denver was chosen as the next place for holding the annual meeting.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Concord, N. H., April 1, 1897.

(Preliminary Circular.)

The Twenty-fifth Annual Meeting of the American Public Health Association will be held at Philadelphia, Pa., October 26, 27, 28, 29, 1897.

The Executive Committee have selected the following topics for consideration:

I. The Pollution of Water Supplies.
II. The Disposal of Garbage and Refuse.
III. Animal Diseases and Animal Food.
IV. Car Sanitation.
V. Steamship and Steamboat Sanitation.
VI. The Prevention of the Spread of Yellow Fever.
VII. The Transportation and Disposal of the Dead.
VIII. The Relation of Forestry to Public Health.
IX. Nomenclature of Diseases and Forms of Statistics.
X. Cause and Prevention of Infectious Diseases.
XI. Public Health Legislation.
XII. Cause and Prevention of Infant Mortality.
XIII. Transportation of Diseased Tissues by Mail.
XIV. River Conservancy Boards of Supervision.
XV. The Peiod during which each Contagious Disease is Transmissible, and the Length of Time for which each Patient is Dangerous to the Community.
XVI. Sanitation, with special reference to Drainage, Plumbing, and Ventilation of Public and Private Buildings.
XVII. Some Method of International Arrangement for Protection against the Transmission of Infectious Diseases.
XVIII. Disinfectants.
XIX. Existing Sanitary Municipal Oganizations of the Countries belonging to the Association, with a view to a Report upon those Most Successful in Practical Results.

Upon all the above subjects, special committees have been appointed. Papers will be received upon other sanitary and hygienic subjects also.

REGULATIONS RELATING TO PAPERS.

Special attention is called to the new regulations in regard to papers. Papers presented later than the time specified (on or before nine o'clock, a. m., of Monday preceding the meeting) will not be placed in the programme, for, contrary to the usage of previous meetings, the entire programme for the week will be printed on Monday preceding the first day of the session.

EXTRACT FROM BY-LAWS.

4. All papers presented to the Association must be either printed, type-written, or in plain handwriting, and in order to secure a place in the programme, must positively be in the hands of the Secretary by nine o'clock, a. m., on Monday preceding the first

day of the meeting, in order that they may be submitted to the Executive Committee, and placed in the hands of the sub-committee charged with the preparation of the daily programme of the session.

5. If any paper is too late for critical examination, said paper may be so far passed upon by the Executive Committee as to allow its reading, but such paper shall be subject to publication or non-publication, as the Executive Committee deem expedient.

6. All papers accepted by the Association, whether read in full, by abstract, by title, or filed, shall be delivered to the Secretary, as soon as thus disposed of, as the exclusive property of the Association. Any paper presented to this Association and accepted by it shall be refused publication in the transaction of the Association, if it be published, in whole or in part, by permission or assent of its author, in any manner prior to the publication of the volume of transactions, unless written consent is obtained from the Publication Committee.

7. All papers on subjects within the province of special committees shall be referred to the chairmen of the several committees, who shall report the same to the Association, incorporated with their annual reports, or refer them to the Executive Committee for consideration.

8. No paper shall hereafter be considered, of which a condensed abstract shall not have been placed in the hands of the Secretary at least twenty days before the date of the annual meeting.

9 Chairmen of committees, in making reports, shall be absolutely limited to thirty minutes, reading of papers to twenty minutes, and participants in discussion to five minutes.

10. Papers presented to the Association shall be confined strictly to sanitary, climatologic, and preventive questions, all clinical, pathological, therapeutic, or other strictly medical statements being excluded; nor shall any paper tending to the advertisement of special or local interests or establishments be accepted.

11. The Secretary shall have no discretion in the matter of the enforcement of the regulations of the Executive Committee as to the acceptance of papers.

It is expected that the Philadelphia meeting will be largely attended. Its location is central, and the local Committee of Arrangements are already hard at work for its success.

An announcement will be made in ample time before the meeting, giving full particulars regarding reduced fares on railroads, hotel rates and accommodations, special entertainments to be arranged by the local committee, et cetera.

All communications relating to local matters should be addressed to Dr. Benjamin Lee, Chairman Local Committee of Arrangements, No. 1532 Pine St., Philadelphia, Pa. Per order.

IRVING A. WATSON,
Secretary.

NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.—Twelfth annual meeting, to be held in Nashville, Tenn., August 18th and 19th, 1897. Local Committee of Arrangements: Dr. J. A. Albright, Chairman; Dr. W. J. McMurray, Dr. W. J. Miller, Hon. Sam N. Warren, Hon. John T. Essary; Dr. J. Berrien Lindsley, Secretary.

The following questions for the consideration of the Conference have been received by the Secretary:

1. Should the Tuberculous Insane be isolated from other inmates in our asylums, and accommodations provided for them in separate and detached buildings?

2. What municipal ordinances shall Boards of Health advise for the restriction of Tuberculosis?

3. What attitude are State Boards of Health prepared to take regarding the need for general inspection of all dairy cattle, and what are the details of any practical scheme for inspecting (*a*) Herds supplying public milk? (*b*) Dairy produce? (*c*) For dealing with animals which react to the tuberculin test?

4. To what extent, if any, should State Boards of Health be expected to furnish a diagnosis of contagious or infectious diseases within their respective jurisdictions?

5. How far should mandatory measures go in dealing with (*a*) Measles? (*b*) Whooping Cough? (*c*) Leprosy? (*d*) Tuberculosis?

6. Should county jails and prisons of the different States be placed under the sanitary supervision of their respective State Boards of Health, which shall have them inspected regularly at stated intervals by a health officer appointed by them or under their control?

7. Should Boards of Health tolerate the feeding of hogs with (*a*) Offal from slaughter houses? (*b*) Meat (cooked or not) from knaker's yards?

8. Report of Committee on Vaccine Farms, Dr. Gardner T. Swarts, Rhode Island, Chairman.

9. Report of Committee on Transportation and Disinfection of Bodies Dead of a Contagious Disease, Dr. J. W. Scott, Illinois, Chairman.

The following amendments to the Constitution are to be voted upon:

"The name of this Association shall be The National Conference of State Boards of Health." The proposed amendment substitutes "American" for "National."

"The members of this Conference shall be the Executive Officers and other delegated representatives of the National, State and Provincial Boards of Health, and the Quarantine Physicians, National, State and Municipal, of the United States of America, the Dominion of Canada and the Republic of Mexico."

—Dr. C. O. PROBST, Secretary and Treasurer.

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THE SANITARIAN.

SEPTEMBER,. 1897.

NUMBER 334.

THE PREVENTION OF TUBERCULOSIS.[1]

BY JOHN B. HAMILTON, M.D., LL.D.,

Professor of the Principles of Surgery and Clinical Surgery in Rush Medical College; Consulting Hygienist to the City of Chicago, etc., Chicago, Ill.

. . . Naturally this is the occasion for reminiscence, a place to recite the triumphs of Preventive Medicine under the auspices of our famous Association. It is true that while the musty records of the past are gilded with the recital of the glories of the Goddess Hygeia, yet so far as records are concerned a thousand years of history are as but a day, compared with the greater progress of this restless but successful age, compressed within the period of the life of this Association. The formation of Boards of Health, of Cattle Commissions and Sanitary Bureaus, and the organization of official forces against epidemics and the spread of infectious diseases, belong to our time, and in this country is largely the result of the educational work of this Association.

The topic which I have selected is that of the Prevention of Tuberculosis. No more important subject could possibly be discussed, for this disease causes about one death in every seven that are recorded in the United States; about one death in every eight is caused by tuberculosis of the lungs alone. It is now known that no tissue of the body is exempt from the invasion of tubercle bacilli, and that the clinical appearances vary so much according to location that tuberculosis is better entitled to be called the "protean" malady than syphilis, unless, indeed, we shall sometimes find a closer relation between syphilis and tuberculosis than has hitherto seemed probable.

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[1] Abstract of the Address in State Medicine at the Semi-Centennial Meeting of the American Medical Association at Philadelphia, June, 1897. From The Journal, June 12, 1897.

Pulmonary tuberculosis alone took 345,963 lives in the five years 1850, 1860, 1870, 1880 and 1890. These were the years in which the United States census was compiled.

The following table from the Ninth United States Census shows for the twenty-eight cities and for their aggregate the number of deaths from consumption during the census year, in the aggregate and for three age groups, per 100,000 of corresponding population, the cities being arranged in the order of magnitude of the aggregate death rates from this cause:

CITIES.	ALL AGES.
Total	268.81
New York	387.45
San Francisco	378.26
Boston	375.72
Washington.	358.95
New Orleans	343.75
Newark	326.68
Providence	303.45
Baltimore	293.02
Brooklyn	288.34
Indianapolis	283.58
Louisville	281.14
Cincinnati	280.22
Philadelphia	279.57
Jersey City	271.77
Denver[2]	240.83
Rochester	213.60
Buffalo	186.18
St. Louis	184.61
Milwaukee	183.89
Kansas City	179.33
Chicago	175.93
Detroit	162.23
Cleveland	158.79
Minneapolis	152.97
Pittsburg	149.19
Allegheny	147.22
St. Paul	125.42
Omaha	67.64

If we add to this enormous mortality the record of the deaths from other forms of tuberculosis, we shall find that tuberculosis rolls up a frightful death record. In my opinion, excluding in-

[2]The deaths upon which death rates from consumption for Denver are computed do not include 133 deaths of non-residents dying of this disease in that city during the census year. (From Ninth U. S. Census, Vital Statistics, Part 2.)

juries by mechanical violence, it is safe to say that localized tuberculosis causes nearly one-third of the surgical diseases for which operation is required, and that of those crippled for life by spinal and joint diseases tuberculosis causes seven-eighths of them.

"In the twenty-eight largest cities of the German Empire the number of deaths from consumption per 100,000 of the aggregate population during the year 1890 was 299, ranging from 453 in Nuremberg, 367 in Dortmund, 357 in Frankfort-on-the-Main, 388 in Crefeld and 353 in Elberfeld, to 236 in Königsberg, 249 in Strasburg, 239 in Halle and 247 in Chemnitz.

"The average annual number of deaths from consumption per 100,000 of inhabitants for the ten years 1881 to 1890 was, for Paris, 463; Nuremberg, 457; Dortmund, 417; Barmen, 381; Aachen, 377; Frankfort-on-the-Main, 373; Crefeld, 373; Bremen, 392, and London, 206. The death rates from consumption in most of the large cities diminished during the ten years 1881 to 1890. The differences in the mortality from consumption in the large cities of the United States depend largely upon differences in the proportion of different races in the several cities, and also, to some extent, upon the age distribution and density of population, on the depth of the level of subsoil water, and on the dryness and uniformity of temperature of the climate. As a rule, the death rate from this cause in large cities is greater than it is in the small towns and rural districts."

General Measures of Relief.—The humanitarian turns to science for relief from this "great white plague," so destructive, so elusive and so calamitous, and it is now the province of State Medicine alone to point out the methods by which we may put this plague "upon a basis of gradual extinction."

The prevention of tuberculosis cannot be accomplished in a day, but its ravages may be made less by such prompt measures on the part of our boards of health as may easily be taken, provided the laity are taken into confidence. The public must be fully educated into an understanding of the causes and method of propagation.

The demonstration that the bacillus tuberculosis is the principal cause of pulmonary consumption and the sole cause of bone tuberculosis is a fact which must be kept before agriculturists, dairymen, stock-breeders and butchers, until the co-operation between them and the health officer is complete. Let the public understand that since the discovery of the bacillus tuberculosis the disease has been

added to the list of diseases that are preventable by attainable means. Let the public schoolmaster understand that he may render his healthy boys and girls immune by gymnastics and calisthenics which increase their vital resistance, for which the object of hygienic regulations is the prevention of the propagation and spread of the tubercle bacilli, yet we know that the healthy tissue cell has a demonstrable power of resistance, so by increasing vital force we may build up a nearly impenetrable barrier against bacillary invasion. Let the consumptive fully understand that he has no right to allow himself to become a center of infection by carelessness, or to marry while the subject of the disease.

Heredity.—The heredity of the disease has been established by "Baraud and Rénon, who reported to the Société de Biologie of Paris, in June, 1895, that they had investigated the question of the direct transmissibility of the bacillus through the placenta to the human fetus. In five cases they took a quantity of blood from the umbilical veins, and injected it under the skin of the abdomen of guinea pigs, immediately after the birth of the child. In three of the cases the guinea pigs did not become tuberculous, while in two they did. In the first case the mother was in the third stage of phthisis, the sputa containing bacilli. There were no lesions of the placenta present, apparently. The guinea pig which was injected developed a cancerous ulcer at the point of inoculation, and died with tuberculosis of the liver and spleen at the end of two months. The bacilli were found in the spleen, pulp and in the caseous masses of the chancerous ulcer. An autopsy performed on the still-born infant gave negative results. Three guinea pigs were injected with the juice of the pulp of the lung and liver and peritoneal serum, and two of them died. In the second case the mother had pulmonary cavities, but no examination of the sputa was made. The child died of broncho-pneumonia on the fortieth day. The placenta presented a normal appearance. At the moment of birth, blood from the umbilical vein was injected into two guinea pigs; one pig died of generalized tuberculosis, the other lived."[3]

Solly, of Colorado, holds that a connection between phthisis in an individual and phthisis in the family may be exercised in one of three ways, viz.: By inheritance of bacilli, by inheritance of susceptibility, or by contagion.[4]

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[3]Health, Oct. 17, 1896.

[4]Gould: The American Year Book of Medicine and Surgery, p. 92.

Lehman has reported a case of congenital tuberculosis where a mother died three days after the birth of the child, of tuberculous meningitis. The child lived but twenty-four hours. In its spleen, lungs and liver were found nodules resembling tubercules and containing tubercle bacilli in large numbers.[5]

Hahn has collected and reviewed some cases of tuberculosis where they were undoubtedly congenital. The semen may also become infected and thus transmit the disease to the fetus. Gartner caused tuberculosis in young mice by injecting the mother with tubercle, either into the peritoneal cavity or into the blood stream.[6]

Baumgarten detected the tubercle bacillus in the ovum of a female rabbit which he artificially fecundated with tuberculous semen.[7]

Infection by Milk.—There is no longer any question of the possibility of infecting the lower animals by the injection of tuberculous milk, but direct evidence of transmission of tuberculosis by milk in man by ingestion is not yet positive, except in cases of udder tuberculosis.

In cows with tubercular disease of the udder, the Royal Commission found that the milk was in every case infective and the experiments made by inoculation in every case gave positive results. As regards feeding, twenty-seven animals were fed with varying quantities of milk from cows with tubercular udders. Of these twenty-seven animals, nineteen developed tuberculosis. The brunt of the disease in these cases fell on the abdominal organs, showing the alimentary origin, but in some cases also there was a more generalized infection. The glands about the mouth and angle of the jaw were also found sometimes tubercular. Dr. Martin, in speaking of these experiments, says:

"The milk of cows with tuberculosis of the udder possesses a virulence which can only be described as extraordinary. In those cows where the tubercle bacilli were found in the milk, the feeding experiments were uniformly positive as well as the inoculation experiments. It is noticeable, too, that a small dose of the milk diluted four times gave tuberculosis to all the animals fed, and that a dose of even 0.05 to 0.1 c.c. diluted with non-infective milk was

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[5]Gould: Loc. cit., p. 41.

[6]Osler on "Tuberculosis" in the American System of Practical Medicine, by Loomis & Thompson, 1897, p. 738.

[7]Osler: Loc. cit.

sufficient to produce tuberculosis."—(T. P. C. Kirkpatrick, "The Spread of Tuberculosis by the Milk Supply," Dublin Journal Medical Science, May, 1897.)

It is well known that many cattle are affected with tuberculosis in this country, that the milk goes into the general supply, and that tubercle bacilli may be found in the milk in cases of udder tuberculosis, and that rabbits inoculated with infected milk or fed upon infected milk become tuberculous. Dilution with non-infected milk attenuates the bacilli, and the dishonest practice of watering is therefore not without its compensation.[8]

Dr. Gehrman, of the Chicago Health Department, after testing the milk from tuberculous cows, writes:[9] "In only one specimen of milk was it possible to demonstrate the presence of the tubercle bacillus microscopically, but in thirty-eight injections of the milk in animals we had the transmission of tuberculosis demonstrated six times.

Infection by Tuberculous Meat.—Tubercle bacilli have been found in the flesh of horses, cattle and swine. Birds and fowls also become infected, and when dogs and cats become infected it is said that they become so by reason of eating flesh of tuberculous animals, but this lacks corroboration by extended experiment.

"In 1890," says Crookshank, "a Royal Commission was appointed to investigate the subject, and the report was issued in 1895. Martin, on behalf of the Commission, tested the flesh of twenty-one tuberculous cows. In two cases only was evidence obtained of the presence of the bacillus by inoculation of guinea pigs. The flesh of eight cows affected with mild tuberculosis produced tubercle in one instance by inoculation, but the ingestion experiments were negative. The flesh of five cows severely affected with tubercle gave the disease in four cases, either by feeding or inoculation, but only one gave the disease both ways. Martin thought that some of the results were due to the butcher infecting the meat in the process of dressing the carcass, either by his hands or knives. Woodhead made a series of experiments to test the effects of roasting and boiling on tubercular virus in meat. It was found that in boiling and roasting experiments as ordinarily carried out in the kitchen, the temperature, however high it may be on the sur-

8Crookshank: "Bacteriology and Infective Disease," 4th ed., 1896

9Special Bulletin. Bovine Tuberculosis and its relation to the Public Health, by the Board of Live Stock Commissioners for the State of Illinois. Springfield, 1896.

face, seldom reaches 60 degrees C. in the center, except in the case of joints less than about six pounds in weight. Boiling and roasting were found insufficient to destroy tubercular virus enveloped in rolls of meat.

The committee having enumerated many obvious preventive measures, made the following suggestions regarding the extirpation of the disease: "We are of opinion that it should be included in the contagious diseases (animals) acts for the purpose of certain sections of those acts, so as to provide: (*a*) For the slaughter of diseased animals, when found diseased on the owner's premises. (*b*) For the payment of compensation for the slaughter of such animals. (*c*) For the seizure and slaughter of diseased animals exposed in fairs, markets, etc., and during transit. (*d*) For the seizure and slaughter of diseased foreign animals at the place of landing in this country."

In the tuberculin tests made in various sections of the country an enormous number of cattle have been found to be tuberculous. According to Wood and Fitz, in Massachusetts, of 4,093 cattle 1,081 reacted positively, and on being slaughtered all but two were found tubercular. In Copenhagen, of 132,294 cattle slaughtered 17.7 per cent. were found tuberculous; of 142,872 slaughtered in Berlin, 15.1 per cent. were tubercular."[10]

The review of the recent reports on this branch of the subject corroborates the former view that careful cooking of meat and boiling of milk before eating or drinking these articles will prevent them from doing positive harm, but few would relish food if it were known to be tuberculous, even if cooked by a Lucullus. An act passed this year by the Maine Legislature to prevent the use of diseased meat for food purposes, provides that all diseased animals killed shall have injected into the carotid artery of each animal kerosene oil in sufficient quantity to thoroughly permeate and penetrate the fleshy parts of the animal, and every carcass thus treated shall be buried within twenty-four hours thereafter to a depth of at least four feet, or within forty-eight hours be reduced by the process of manufacturing the same for fertilizers.

Sources of Danger.—Our danger from tuberculous meat is not very great in comparison with the dangers that confront us in daily contact with consumptives, notwithstanding the fact that it is not the patient himself, but his expired air and sputum that are dangerous. Bergey, of Philadelphia, however, in a paper read before the

10 "The Practice of Medicine," by H. C. Wood and R. H. Fitz, 1897.

American Climatological Association in 1896, asserted that numerous experiments with the collected moisture of consumptives' breath, even those with extensive cavity formations, gave negative results. The great danger is in the dried sputum. Kruger showed that the dust of a hospital ward in which patients with pulmonary consumption expectorated occasionally, contained tubercle bacilli (Sternberg). This he proved by wiping up the dust on a sterilized sponge, washing this sponge in bouillon which was subsequently injected into guinea pigs. Two of the pigs became tuberculous. More conclusive experiments were made originally by Cornet. The experiments of G. Cornet showed the absence of infectivity in the dust of rooms and hospital wards where precautions were taken against the drying of the sputa, and also proved the rapidly fatal action of sunlight on the bacilli. On the other hand, he demonstrated the insignificance of so-called predisposition compared with the influence of over-crowding, dirt, darkness and damp, and he demonstrated the necessity of prolonged and close association with tuberculous patients for the direct infection of healthy patients. (London Lancet, April 3, 1897.)

These experiments were repeated by Hance (Gould, Year Book, page 32), who collected the dust from the floors and walls of the various buildings at the sanitarium for consumptives, suspending it in sterilized water and inoculating a number of guinea pigs. Of eighty-one animals used, five developed tuberculosis, being half of the number injected with the dust from a cottage in which a patient had been reported for carelessness. Four of the pigs died of other infectious diseases, while the remainder remained healthy.

To sum up, it appears that the greatest danger is from the dried sputum, and that other causes, while they exist, are of much less importance. The local infections that are found in the bones and internal viscera are produced by invasion through the circulation, while the infection of lymphatic glands doubtless takes place by direct absorption through the lymph channels. Every surgeon has noticed, without doubt, that tuberculous glands become successively affected; it is the exception to find a whole chain of glands simultaneously affected. When the tubercular lesion is found in the skin the point of invasion is an abrasion; or a center beginning in the hair follicle.

The means of prevention of the spread of tuberculosis is then sufficiently apparent after we have taken our observations on the methods of infection. The factors in successful prophylaxis are:

1. The guarding against infectious food or drink being issued to the people anywhere. 2. The prompt destruction of cattle proved to be tuberculous. 3. Proper notification to the sanitary officer of the occurrence of cases of tuberculosis, especially walking cases of pulmonary consumption, in order that the officer may in conjunction with the attending physician make sure that proper precautions shall be taken to secure thorough disinfection of sputum and bedding.

Early Diagnosis.—Not only as a means of prevention, but as a curative procedure, is it important to make an early diagnosis. Physical signs are not always pronounced, and the bacilli may escape observation. The tuberculin test is therefore not less valuable in man than in animals, but the dose must be carefully graduated.

There has been much discussion over a recent requirement of some of our municipal boards, by which notification of cases of pulmonary tuberculosis are made compulsory. We must admit that consumption is slowly decreasing throughout the civilized world; but that decrease is only such as results from the improved hygiene of the day, and is not so great as the present state of knowledge warrants, for modern sanitation will only be satisfied by the extirpation of the disease.

To make extirpation possible we must adopt no half-way measures; prompt notification should be the rule, whether any specific measures are to be taken by the Health Department or not. That body can at least send printed information regarding the sanitary care of the patient and his apartments. No better justification of the recent order of the New York City Board of Health can be found than in the frightful records of mortality, from a disease which, as already stated, in its various forms causes one-seventh of all the deaths.

The following is the amendment to the sanitary code of New York city, adopted January 19, 1897:

Section 225. That pulmonary tuberculosis is hereby declared to be an infectious and communicable disease, dangerous to the public health. It shall be the duty of every physician in this city to report to the Sanitary Bureau in writing the name, age, sex, occupation and address of every person having such disease who has been attended or who has come under the observation of such physician for the first time within one week of such time.

It shall also be the duty of such commissioners or managers, or

the principal, superintendent or physician of each and every public or private institution or dispensary in this city to report to the Sanitary Bureau in writing, or to cause such report to be made by some proper and competent person, the name, age, sex, occupation and last address of every person afflicted with this disease who is in their care or who has come under their observation within one week of such time. It shall be the duty of every person sick with this disease and of every person in attendance upon any one sick with this disease, and of the authorities of public and private institutions or dispensaries to observe and enforce all the sanitary rules and regulations of the Board of Health for preventing the spread of pulmonary tuberculosis.

The new law renders physicians and laymen alike liable to punishment for misdemeanor when any part of the section is violated. This order is the result of a report presented to the board by Dr. Hermann M. Briggs, pathologist of the department and director of the bacteriological laboratories; Commissioner George B. Fowler and Dr. T. Mitchell Pruden, consulting pathologist. The report showed that in twelve years the mortality from tuberculosis had decreased 30 per cent., owing to the steps taken by the department to prevent its spread. It was argued that more radical measures would produce even a greater reduction of the disease, and the amendment to the code was recommended.

A feature of the new law is the isolation of patients in aggavated cases.

The next step will undoubtedly be the erection and establishment of suitable sanitariums for the reception and care of those unable to be suitably cared for at their homes. Careful observation of the general principles of hospital construction as now understood will make it comparatively easy to construct special buildings with abundance of fresh air, plenty of sunlight and capable of being kept scrupulously clean. Then with proper regulations for the government of the inmates no one of them can possibly communicate the disease to others; besides that, his condition can be made infinitely more comfortable. Patients able to avail themselves of a prolonged residence in Arizona or New Mexico, or other approved climates, if not too far advanced, may reasonably expect a cure. The most rigid observance of sanitary regulations is necessary everywhere to prevent the sanitarium itself from becoming a center of infection. Daily sponging of the walls, floors and furniture, daily changes of bed linen, daily changes of patient's

body-clothing and its subsequent disinfection or exposure to the sun, careful regulation of temperature of the ward or room in which the patient is kept, besides the usual therapeutic measures. are the indications that should be met. These special hospitals have been doing excellent work in England, where it is asserted that the general mortality has been greatly reduced since their establishment. The same is reported as true in France and Germany. Our own are few, but have done excellent service

Should the States take up the matter of location of sanitariums. it is obvious that the location should be convenient of access and not too remote from the great centers of population.

In regard to the doubt often expressed that large sanitariums often become dangerous to the neighborhood, Dr. Knopf[11] has well laid that doubt at rest by citing the case of the sanitariums at Goerbersdorf and Falkenstein, the two largest in Germany. where "the mortality from tuberculosis has actually decreased among the village people, being now one-third less than before the establishment of those institutions."

We should be on our guard against the frightful treatment of consumptives that prevailed a couple of centuries ago, by which patients were feared and subjected to every hardship, and shunned as if they had smallpox or cholera.

The Formation of Colonies for Consumptives.—The climatic conditions of the different parts of each State should be thoroughly investigated by disinterested parties, and the report published in one volume under the auspices of the State Medical Society, and then with the procurement of these data colonies may be formed to the best advantage.

What shall be done with the large class of tubercular patients that can not or will not go to a sanitarium? Clearly the same rules must be applied so far as possible, the patient must not expectorate in public places if he goes out, and he should burn the sputum at home, which he can do easily if he uses paper receptacles for his sputum. For bedridden patients the physician in attendance will be the best authority, and his intelligent supervision will prevent the patient from becoming a nuisance.

Marriage of Tuberculous Should be Opposed.—The law prevents marriage within certain degrees of consanguinity: no account is

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[11]**Knopf: The Hygienic, Educational and Symptomatic Treatment of Pulmonary Tuberculosis, with a Plea for the Sanitariums for the Poor. Medical Record, N. Y., Feb. 13, 1897.**

taken of the physical state of the contracting parties, although in many States, severe physical causes are especially named as sufficient cause for divorce. If chronic and incurable disease be sufficient ground for separation, how much more reason is there for the prohibition of the marriage rite. The insane and incurably diseased should not be allowed to propagate their species, unless we confine our sympathy to the individual instead of the whole people. The heredity of the disease has at last been fairly proved by scientific investigation. Public opinion should now do the rest. I am fully convinced that even now matters are so well understood that little effort will be needed. Great delicacy is needed in the practical handling of this means of prevention, for as love laughs at locksmiths, so it does at sanitary regulations if they happen to be restrictive.

The discovery of the bacillus tuberculosus has thus resulted in making clear the means of its prevention, and able experimenters by the hundred are patiently working out a cure; some seem to have it almost within their grasp; some proclaim that they already have it, but the great body of the profession are waiting. There are too many cures on the market for us to conclude rashly that the certain specific has been found; I am aware that the subject of therapeutics of tuberculosis is not properly under discussion in this address, but as silence may be misconstrued, permit me to say that modern treatment by open air, by climate properly chosen, by education, by pulmonary gymnastics, by hydropathy, by mental diversions, by serum therapy and proper medication, have done much to make the consumptive's life more endurable, less likely to infect his fellows, and in many instances have effected a cure.

According to Dr. Rooney, of California, mountain air laden with balsams and terebinths, sea-shore air and sea air, all have their importance in different cases. Hypertrophic cases do best in mountain air, especially where hereditary, chronic pneumonia and pleurisy, apyrexia, emphysema, spinal and cerebral complications, lesions in the blood vessels and heart, liver and kidneys are found as complications. Cases in which cavities have developed with hemorrhages and general debility are benefited most by sea voyages, or prolonged residence on the sea shore. All these points should be thoroughly investigated before sending a patient to any locality, or establishing tuberculous colonies. (Pacific Med. Jour., May, 1897.)

The English Royal Commission on Tuberculosis visited Germany, investigating this question, in May, and afterward Denmark, whence I understand they will return to London. Professor Bang, with the sanction of the Danish Government, is now conducting experiments on a large scale, and we may soon have the benefit of the published results.

I have the utmost faith in the ultimate success of the great efforts now being made by sanitarians throughout the world to eradicate the tuberculosis pest—and after all, the efforts themselves are worth something and have their effect.

Richardson's "City of Hygeia," that "beautiful fabric of a vision," as one of our countrymen has said, "was blown away by the winds, but they blew it all over the earth." So the wide dissemination of correct knowledge concerning the cause and propagation of tuberculosis cannot but tend to still further restrict its ravages, and thus add to the sum of human happiness and the prolongation of human life.

TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF WISCONSIN.

By A. N. Bell.

Wisconsin is situated between the parallels of 42° 27′ and 47° north latitude and the meridians of 86° 53′ and 92° 53′ west longitude, from Greenwich, comprehending an area of 56,040 square miles. The State is bounded on the north by Lake Superior, northeast by the upper peninsula of Michigan, east by Lake Michigan, south by Illinois and west by Iowa and Minnesota; extreme length from north to south, 300 miles; extreme breadth 250 miles, and has a lake coast of over 500 miles. The State for the most part is an extensive plain, elevated from 600 to 1,800 feet above the level of the sea, varied only by the cliffs bordering the rivers and lakes.

The greatest elevations are the Blue Mounds, near Madison, in Dane County; and the Penokee range of Laurentian or granite hills extending northeast to southwest, about twenty miles south of Lake Superior, and forming, with its outlying spurs, a triple watershed—the northward descent carrying streams flowing into Lake Superior; that sloping southeast streams feeding Lake Michigan; and that sloping south and southwest the affluents of rivers emptying into the Mississippi. A longitudinal ridge of Niagara limestone follows the shore of Lake Michigan about thirty miles in the

interior, and in the main separates the lake drainage from that of the Mississippi.

In the glacial period, Wisconsin, excepting about 10,000 square miles in the southwest, was covered by the ice cap, which left about 2,000 minor lakes in the eastern and northern portions, with many picturesque gravel knolls, domes of drift and morainic peaks and ridges. In the driftless area, deep detritic valleys, erosion cliffs and castellated outlines are characteristic features. One of the most striking of these features is the diagonal valley formed by the Wisconsin and Fox rivers and Green Bay. About the center of this valley, at Portage, the Fox and Wisconsin rivers (the one a member of the Great Lake drainage system, the other flowing into the Mississippi) are separated by a marsh about one and a half miles in width, which is sometimes overflowed in spring, when it appears as a considerable lake.

Of the lakes, the largest in the State is Lake Winnebago—twenty-six miles long by a maximum breadth of ten miles, comprising an area of 212 square miles; and is situated 748 feet above the level of the ocean. It is navigable by steamboats and abounds in fish of various species. At its head is the flourishing town of Fond du Lac; on the west shore Oshkosh: both possessed of rare natural features as summer resorts, and becoming more and more attractive by reason of excellent hotel accommodations and mineral waters. Green Lake is a beautiful sheet of water, about four hours distant from Chicago and two from Milwaukee, the railway ride being along the shores of Lake Michigan and Lake Winnebago and through picturesque hills and valleys. The lake itself is ten miles long, with an average width of about two and a half miles, with shores of rare beauty and picturesqueness. Dartford, a flourishing town on its banks, a station on the Sheboygan and Fond du Lac Railway, supplies excellent and abundant hotel accommodations, boats and other facilities for enjoyment. Oakwood, Sherwood Forest, Pleasant Point, Maplewood and Lake View are all well situated and admirably appointed hotels on the shores. Lake Pepin is a beautiful lake-expansion of the Mississippi, shared with Minnesota, mostly walled in by precipitous shores which rise in places to five hundred feet; and connected with almost every cliff or promontory along the shores are interesting legends of the Indians who formerly dwelt there.

The principal rivers which flow into Lake Superior are the St. Louis, Bois Brulé, Bad and Montreal; into Green Bay are dis-

charged the Fox, Pensaukee, Oconto, Peshtigo and Menominee. Lake Michigan receives the Kewaunee, Sheboygan and Milwaukee; and the chief rivers emptying into the Mississippi are the Wisconsin, Black, Trempealeau, Buffalo, Chippewa and St. Croix.

Along the rivers are many beautiful waterfalls. In the St. Louis River are the Dalles, which have a descent of three hundred and fifty feet. The Dalles of the St. Croix also have been long noted for their picturesqueness. Quinnepec, in Menominee River, have a perpendicular fall of over fifty feet and a general descent of one hundred and fifty feet in a mile and a half, and many other rapids, where the river dashes through narrow and tortuous defiles. The Chippewa Falls and the Big Bull Falls are also meritorious halting places for the tourist on sightseeing and healthful recreation bent. But the Wisconsin River above all presents many grand and picturesque views. Beginning in Richmond County, the banks of the river rise from two hundred to two hundred and fifty feet; and in Sauk County, where the rives passes through a narrow gorge, to six hundred feet. Grand Father Bull Falls occur amidst turbulent rapids, succeeded by a series of wild cascades dashing through a gorge a mile and a half long and one hundred and fifty feet perpendicular height—an almost bewildering scene, but than which it is difficult to conceive anything more likely to stimulate healthy emotions.

The number and distribution of the lakes and rivers throughout the State is such that the natural drainage of the soil is unusually excellent, and miasmatic diseases proportionally uncommon. For illustration:

By the census of 1890, out of 18,752 deaths from all causes, the number from malarial diseases was only 76, or 4.05 per 1,000 of the total mortality. Compared with a similar mortality in North Carolina (but with a smaller population: Wisconsin, 1,686,680; North Carolina, 1,051,720), of 18,420 deaths from all causes, the number from malarial diseases was 604, or 32.82 per 1,000 from all causes. Particularly worthy of mention in this regard is the situation of the Penoyer Sanitarium, the most commodious and best appointed sanitary institution in the Northwest. It occupies a plot of seventy-five acres at the top of a knoll on the shore of Lake Michigan, adjoining the northern limits of Kenosha, nearly midway between Chicago and Milwaukee. The soil is sandy and dry, the buildings being thirty-two feet above the level of the lake, with a gradual slope in front to the water's edge, while to the north

and west a deep ravine is a marked feature of the landscape, thus affording the best possible drainage and the most desirable sanitary condition for a building site.

In the central part of the State are wide areas of comparatively unfertile, sandy soil, derived from the underlying Potsdam sandstone; in the Penokee range are tracts too rocky for cultivation; but for the most part the soil is arable and some of it highly fertile, consisting of the drift area of sandy and clay loams derived from the heterogeneous mixture of pre-glacial soils and glacial grindings; and in the driftless southwest it consists of the results of the decomposition of underlying limestone. Before the advent of whites, heavy forests covered much of the State—oaks, maples, ash, poplar, hickory and the like. Extensive regions in the north were timbered with pines, hemlocks and spruce, with which were mingled many deciduous trees. In the south and west the colonists found large prairies surrounded by forests of hardwood, and also much country in which the woods were dotted with small treeless areas. Most of the timber in the south and east has been removed by agricultural settlers, and the northern conifers have suffered much depletion from lumbering operations; but there yet remains a large piney belt, which should be taken care of as an important adjunct to the

CLIMATE.—The winters are protracted and often severe, the mean winter temperature varying from about 25° in the southern counties to about 15° on the Lake Superior shore. The summer is brief and warm, the mean temperature varying from about 70° in the extreme south to about 60° in the extreme north; but there are frequent brief rains and cool southern and eastern winds.

The following is a table of means for the entire State for the year 1893:

Month.	Temperature.	Precipitation.	Month.	Temperature.	Precipitation.
	°	Inches.		°	Inches.
January	5.5	1.48	July	71.1	3.96
February	12.7	1.84	August	66.7	2.03
March	25.8	2.30	September	59.1	2.32
April	40.8	4.45	October	48.5	2.49
May	52.0	2.54	November	31.3	1.33
June	68.6	2.45	December	16.0	2.67

Annual mean temperature, 41.5°; precipitation, 29.8 inches.

The MINERAL WATERS of Wisconsin are generally recognized as among the most valuable, and some of them are extensively sold in all parts of the country. They are chiefly *calcareous*—that is to say, they contain an excess of the carbonates and sulphates of lime and other alkaline earths; or they are chemically *indifferent*—contain these and other salts in small and equally distributed proportions, and these are the commonly preferred table waters; and a few *chalybeate* and *saline* springs. They are as follows:

Arctic Springs, Galesville, Trempealeau County. W. W. Daniels, analyst.

Calcareous.

Calcium bicarbonate	grains per gallon.		13.65
Magneisum bicarbonate	"	"	9.84
Iron bicarbonate	"	"	0.26
Sodium sulphate	"	"	0.07
Potassium sulphate	"	"	0.19
Sodium chloride	"	"	0.76
Calcium chloride	"	"	0.05
Aluminium oxide	"	"	0.15
Silica	"	"	0.06
Total			25.03

Artesian Well, Madison, Dane County. G. Bode, analyst.

Calcareous.

Sodium bicarbonate	parts in 1,000.		0.04
Calcium bicarbonate	"	"	0.14
Magnesium bicarbonate	"	"	0.12
Iron bicarbonate	"	"	0.01
Sodium sulphate	"	"	0.03
Sodium chloride	"	"	0.01
Silica	"	"	0.03
Total			0.38

Artesian Well, Fond du Lac, Fond du Lac County. G. Bode, analyst.

Indifferent.

Calcium bicarbonate	parts in 1,000.		0.11
Magnesium bicarbonate	"	"	0.08
Sodium sulphate	"	"	0.07
Calcium sulphate	"	"	0.01
Sodium chloride	"	"	0.07
Silica	"	"	0.01
Total			0.35

Bethesda Spring, Waukesha, Waukesha County. C. F. Chandler, analyst.

Calcareous.

Sodium bicarbonate	grains	per gallon.	1.20
Calcium bicarbonate	"	"	17.02
Magnesium bicarbonate	"	"	12.39
Iron bicarbonate	"	"	0.04
Sodium sulphate	"	"	0.54
Potassium sulphate	"	"	0.46
Sodium phosphate	"	"	Trace
Sodium chloride	"	"	1.16
Aluminium oxide	"	"	0.12
Silica	"	"	0.74
Organic matter	"	"	1.98
Total			35.71

Black Earth Mineral Springs, Black Earth, Dane County. A. C. Barry, analyst.

Chalybeate.

Sodium carbonate	parts in	1,000.	5.10
Calcium carbonate	"	"	40.00
Magnesium carbonate	"	"	25.00
Iron carbonate	"	"	12.00
Sodium sulphate	"	"	10.00
Potassium sulphate	"	"	0.10
Sodium chloride	"	"	3.30
Aluminium oxide	"	"	1.00
Silica	"	"	1.30
Organic matter	"	"	Trace
(Confessedly incomplete) Total			97.80

Bristol Soda Springs, Woodworth, Kenosha County. A. G. Mariner, analyst.

Alkaline.

Sodium bicarbonate	grains	per gallon.	8.89
Calcium bicarbonate	"	"	4.36
Magnesium bicarbonate	"	"	3.21
Iron bicarbonate	"	"	0.49
Sodium sulphate	"	"	7.74
Sodium chloride	"	"	0.43
Silica	"	"	0.80
Total			25.92

Buckhert's Fountain, Watertown, Jefferson County. L. Brandecke, analyst.

Calcareous.

Sodium bicarbonate	grains	per	gallon. 1.90
Calcium bicarbonate	"	"	12.09
Magnesium bicarbonate	"	"	5.82
Iron bicarbonate	"	"	0.10
Potassium sulphate	"	"	0.05
Silica	"	"	0.30
Organic matter	"	"	0.35
Total			20.61

Madison City Well, Madison, Dane County. W. W. Daniels, analyst.

Calcareous.

Sodium bicarbonate	grains	per	gallon. 1.09
Calcium bicarbonate	"	"	15.24
Magnesium bicarbonate	"	"	12.98
Iron bicarbonate	"	"	0.21
Sodium sulphate	"	"	0.29
Potassium sulphate	"	"	0.24
Sodium phosphate	"	"	Trace
Sodium chloride	"	"	0.29
Aluminium oxide	"	"	Trace
Silica	"	"	0.42
Total			30.76

Clysmic Springs, Waukesha, Waukesha County. R. O. Doremus, analyst.

Calcareous.

Sodium bicarbonate	grains	per	gallon. 4.431
Calcium bicarbonate	"	"	16.153
Magnesium bicarbonate	"	"	9.221
Iron bicarbonate	"	"	0.572
Sodium sulphate	"	"	0.693
Potassium sulphate	"	"	0.500
Sodium phopshate	"	"	0.429
Sodium chloride	"	"	0.355
Silica	"	"	0.802
Alumina	"	"	Trace
Organic matter	"	"	Trace
Total			33.156

Eureka Springs, Milwaukee, Milwaukee County. G. Bode, analyst.

Saline.

Sodium bicarbonate	parts in	1,000.	0.13
Calcium bicarbonate	"	"	0.41
Magnesium bicarbonate	"	"	0.18
Sodium sulphate	"	"	0.26
Sodium chloride	"	"	3.35
Aluminium oxide	"	"	0.19
Silica	"	"	0.12
Total			4.64

Gihon Springs, Delavan, Walworth County. G. Bode, analyst.

Calcareous.

Calcium bicarbonate	parts in	1,000.	10.27
Magnesium bicarbonate	"	"	7.14
Iron bicarbonate	"	"	0.20
Sodium sulphate	"	"	0.95
Sodium chloride	"	"	0.47
Aluminium oxide	"	"	0.13
Silica	"	"	0.75
Total			19.91

Waukesha-Hygeia Mineral Spring, Waukesha, Waukesha County. A. W. Palmer, analyst.

Calcareous.

Sodium chloride	grains per	gallon.	1.892
Magnesium chloride	"	"	0.210
Potassium sulphate	"	"	0.691
Magnesium sulphate	"	"	4.035
Magnesium nitrate	"	"	1.622
Lithium bicarbonate	"	"	0.066
Magnesium bicarbonate	"	"	4.630
Calcium bicarbonate	"	"	19.229
Iron phosphate	"	"	0.008
Iron and Alumina oxide	"	"	3.039
Silica	"	"	0.705
Sodium bromide and biborate	"	"	Traces
Total			36.127
Carbonic acid	cubic	inches.	1.432

Fountain Spring, Waukesha, Waukesha County. J. V. Z. Blaney, analyst.

Calcareous.

Sodium bicarbonate	grains	per gallon.	1.02
Calcium bicarbonate	"	"	13.78
Magnesium bicarbonate	"	"	9.20
Iron bicarbonate	"	"	0.05
Sodium sulphate	"	"	0.36
Sodium chloride	"	"	Trace
Aluminium oxide	"	"	0.09
Silica	"	"	0.55
Organic matter	"	"	0.31
Total			25.36

Glenn Springs, Waukesha, Waukesha County. C. F. Chandler, analyst.

Calcareous.

Sodium bicarbonate	grains	per gallon.	0.76
Calcium bicarbonate	"	"	15.98
Magnesium bicarbonate	"	"	11.58
Iron bicarbonate	"	"	0.09
Sodium sulphate	"	"	0.62
Potassium sulphate	"	"	0.49
Sodium phosphate	"	"	Trace
Sodium chloride	"	"	1.19
Aluminium oxide	"	"	0.05
Silica	"	"	1.05
Organic matter	"	"	2.21
Total			34.02

Gomber's Well, Brodhead, Green County. Analysis as advertised.

Calcareous.

Sodium bicarbonate	grains	per gallon.	0.03
Calcium bicarbonate	"	"	6.66
Magnesium bicarbonate	"	"	4.86
Iron bicarbonate	"	"	0.23
Sodium sulphate	"	"	0.17
Sodium chloride	"	"	0.32
Aluminium oxide	"	"	0.13
Silica	"	"	0.69
Organic matter	"	"	0.18
Total			13.27

Hacket's Spring, Hale's Corners, Milwaukee County. G. analyst.

Calcareous.

Sodium bicarbonate	grains	per gallon.
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Iron bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Total		

Horeb Mineral Spring, Waukesha, Waukesha County. Bode, analyst.

Calcareous.

Calcium bicarbonate	grains	per gallon.
Magnesium bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Total		

Hunter's Magnetic Mineral Fountain, Fond du Lac, Fo Lac County. E. J. Gillett, analyst.

Saline.

Sodium carbonate	parts in	100
Calcium carbonate	"	"
Magnesium carbonate	"	"
Potassium carbonate	"	"
Sodium sulphate	"	"
Calcium sulphate	"	"
Magnesium sulphate	"	"
Potassium sulphate	"	"
Sodium chloride	"	"
Potassium chloride	"	"
Silica	"	"
Iron and Bromine	"	"
Loss	"	"
Total		

Total solids, 19 grains per gallon.

Iodo-Magnesian Springs, Beloit, Rock County. C. F. Chandler, analyst.

Calcareous.

Sodium bicarbonate	grains per gallon.		0.14
Calcium bicarbonate	"	"	14.52
Magnesium bicarbonate	"	"	12.28
Iron bicarbonate	"	"	0.04
Calcium sulphate	"	"	0.13
Potassium sulphate	"	"	0.31
Sodium phosphate	"	"	0.01
Sodium chloride	"	"	0.34
Sodium bromide and iodide	"	"	Traces
Aluminium oxide	"	"	0.06
Silica	"	"	0.76
Organic matter	"	"	Trace
Total			28.59

Magnetic Well, Watertown, Jefferson County. G. Bode, analyst.

Indifferent.

Calcium bicarbonate	parts in 1,000.		0.19
Magnesium bicarbonate	"	"	0.13
Iron bicarbonate	"	"	Trace
Sodium sulphate	"	"	0.02
Calcium sulphate	"	"	0.01
Sodium chloride, Aluminium oxide	"	"	Traces
Silica	"	"	0.02
Total			0.37

Market Square Spring, Milwaukee, Milwaukee County. G. Bode, analyst.

Indifferent.

Sodium bicarbonate	parts in 1,000.		0.04
Calcium bicarbonate	"	"	0.37
Magnesium bicarbonate	"	"	0.36
Sodium sulphate	"	"	0.03
Calcium sulphate	"	"	0.16
Sodium chloride	"	"	0.43
Potassium chloride	"	"	0.03
Silica	"	"	0.04
Total			1.46

Jacob's Artesian Well, Milwaukee, Milwaukee Count Bode, analyst.

Calcareous.

Calcium bicarbonate	grains per gallon.	
Magnesium bicarbonate	"	"
Iron bicarbonate	"	"
Sodium sulphate	"	"
Calcium sulphate	"	"
Sodium chloride	"	"
Potassium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Total		

Jordan's Mineral Well, Galesville, Trempealeau Count Bode, analyst.

Chalybeate.

Sodium bicarbonate	grains per gallon.	
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Iron bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Organic matter	"	"
Total		

Lethean Spring, Waukesha, Waukesha County. G. analyst.

Indifferent.

Sodium bicarbonate	parts in 1,000.	
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Iron bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Total		

Mineral Spring, East Troy, Walworth County. G. Bode, analyst.

Indifferent.

Calcium bicarbonate	parts in	1,000.	0.21
Magnesium bicarbonate	"	"	0.14
Sodium sulphate	"	"	0.02
Sodium chloride	"	"	0.01
Silica	"	"	0.02
Total			0.40

Mineral Rock Spring, Waukesha, Waukesha Co. G. Bode, analyst.

Indifferent.

Sodium bicarbonate	parts in	1,000.	0.02
Calcium bicarbonate	"	"	0.17
Magnesium bicarbonate	"	"	0.14
Sodium sulphate	"	"	0.02
Sodium chloride	"	"	0.01
Silica	"	"	0.02
Organic matter	"	"	Trace
Total			0.38

Nemabin Mineral Springs, Delafield, Waukesha County. G. Bode, analyst.

Indifferent.

Sodium bicarbonate	parts in	1,000.	0.02
Calcium bicarbonate	"	"	0.21
Magnesium bicarbonate	"	"	0.09
Sodium sulphate	"	"	0.02
Sodium chloride	"	"	0.02
Silica	"	"	0.02
Iron bicarbonate, Aluminium oxide	"	"	Traces
Total			0.38

New Saratoga Springs, Star Prairie, St. Croix County. G. Bode, analyst.

Calcareous.

Sodium bicarbonate	grains per	gallon.	0.81
Calcium bicarbonate	"	"	4.00
Magnesium bicarbonate	"	"	3.07
Iron bicarbonate	"	"	0.74
Sodium sulphate	"	"	0.08
Sodium chloride	"	"	0.13
Silica	"	"	1.04
Total			9.87

Palmyra Springs.

Lowe's Springs, Palmyra, Jefferson County. G. Bode, a

No. 1. *Calcareous.*

Sodium bicarbonate	grains	per gallon.
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Iron oxide	"	"
Silica	"	"
Total		

No. 2. *Calcareous.*

Sodium bicarbonate	grains	per gallon.
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Iron oxide	"	"
Silica	"	"
Total		

Bidwell Spring. *Calcareous.*

Sodium bicarbonate	grains	per gallon.
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Iron bicarbonate	"	"
Sodium sulphate	"	"
Sodium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Total		

Zenobia's Fountain. *Calcareous.*

Sodium bicarbonate	grains	per gallon.
Calcium bicarbonate	"	"
Magnesium bicarbonate	"	"
Sodium sulphate	"	"
Calcium sulphate	"	"
Sodium chloride	"	"
Aluminium oxide	"	"
Silica	"	"
Total		

Eye Spring. *Calcareous.*

Sodium bicarbonate	grains	per	gallon. 0.16
Calcium bicarbonate	"	"	9.86
Magnesium bicarbonate	"	"	7.92
Iron bicarbonate	"	"	0.06
Sodium sulphate	"	"	0.64
Calcium sulphate	"	"	0.30
Sodium chloride	"	"	0.21
Aluminium oxide	"	"	0.19
Silica	"	"	0.61
Organic matter	"	"	0.35
Total			20.30

St. Croix Mineral Spring, East Farmington, Polk County. J. V. Z. Blaney, analyst.

Calcareous.

Sodium bicarbonate	grains	per	gallon. 0.79
Calcium bicarbonate	"	"	11.19
Magnesium bicarbonate	"	"	7.25
Sodium sulphate	"	"	0.52
Sodium chloride	"	"	0.05
Iron and Aluminium oxide	"	"	0.49
Silica	"	"	0.27
Organic matter	"	"	Trace
Total			20.56

Schweickhardt's Spring, Wauwatoka, Milwaukee County. G. Bode, analyst.

Indifferent.

Sodium bicarbonate	parts	in	1,000. 0.01
Calcium bicarbonate	"	"	0.21
Magnesium bicarbonate	"	"	0.15
Iron bicarbonate	"	"	0.01
Sodium sulphate	"	"	0.01
Sodium chloride	"	"	Trace
Silica	"	"	0.03
Organic matter	"	"	Trace
Total			0.42

Oakton Springs, Pewaukee, Waukesha County. J. Blaney, analyst.

Indifferent.

Sodium bicarbonate	parts in 1,000.
Calcium bicarbonate	" "
Magnesium bicarbonate	" "
Iron bicarbonate	" "
Sodium sulphate	" "
Sodium chloride, Aluminium oxide	" "
Silica	" "
Organic matter	" "
Total	

Rahr's Artesian Well, Manitowoc, Manitowoc County .Bode, analyst.

Indifferent.

Calcium bicarbonate	parts in 1,000.
Sodium sulphate	" "
Calcium sulphate	" "
Magnesium sulphate	" "
Potassium chloride	" "
Calcium chloride	" "
Silica	" "
Total	

Richmond Spring, Whitewater, Walworth County. J. E ner, analyst.

Indifferent.

Sodium bicarbonate	parts in 1,000.
Calcium bicarbonate	" "
Magnesium bicarbonate	" "
Iron bicarbonate	" "
Potassium sulphate	" "
Sodium sulphate, Aluminium oxide	" "
Sodium chloride	" "
Calcium chloride	" "
Silica	" "
Organic matter	" "
Total	

caltiel Mineral Springs, Waupaca, Waupaca County. G.
, analyst.

Calcareous.

im bicarbonate	grains per gallon.		0.76
um bicarbonate	"	"	6.44
iesium bicarbonate	"	"	6.36
bicarbonate	"	"	0.05
im sulphate	"	"	0.19
im chloride	"	"	0.16
inium oxide	"	"	0.09
	"	"	0.60
al			14.65

:boygan Mineral Spring, Sheboygan, Sheboygan County. G.
, analyst.

Saline.

um bicarbonate	grains per gallon.		1.49
iesium bicarbonate	"	"	0.38
um sulphate	"	"	76.15
iesium sulphate	"	"	89.33
sulphate	"	"	0.74
im chloride	"	"	367.65
um chloride	"	"	109.30
iesium chloride	"	"	9.91
um chloride	"	"	0.02
im bromide	"	"	1.06
im iodide	"	"	0.02
inium oxide	"	"	1.10
	"	"	0.73
al			657.88

oam Springs, Waukesha, Waukesha County. G. Bode.
st.

Indifferent.

im bicarbonate	parts in 1,000.		0.02
um bicarbonate	"	"	0.22
iesium bicarbonate	"	"	0.13
im sulphate	"	"	0.05
im chloride	"	"	0.02
	"	"	0.01
tal			0.45

Sheridan Springs, Lake Geneva, Walworth County. G. Bode, analyst.

Calcareous.

Calcium bicarbonate	grains per	gallon.	12.55
Magnesium bicarbonate	"	"	10.28
Iron bicarbonate	"	"	0.11
Sodium sulphate	"	"	0.30
Calcium sulphate	"	"	1.43
Sodium chloride	"	"	0.31
Aluminium oxide	"	"	0.05
Silica	"	"	0.73
Organic matter	"	"	0.23
Total			25.99

Utley Mineral Spring, Utley, Green Lake County. C. D. Marsh, analyst.

Indifferent.

Calcium	parts in	100.	.0063440
Magnesium	"	"	.0036072
Alumina	"	"	.0004110
Chlorine	"	"	.0005000
Sulphuric acid	"	"	.0013100
Carbonic acid	"	"	.0118600
Silica and Iron	"	"	Undetermined
Sodium	"	"	Trace
Total			.0240322

Artesian Mineral Well, Prairie du Chien, Crawford County. G. Bode, analyst.

Saline.

Calcium carbonate	grains per	gallon.	.6222
Magnesium carbonate	"	"	10.9739
Iron bicarbonate	"	"	.2318
Sodium sulphate	"	"	12.7978
Calcium sulphate	"	"	15.3699
Sodium chloride	"	"	90.2007
Potassium chloride	"	"	3.8064
Sodium bromide	"	"	.1281
Sodium phosphate	"	"	Trace
Silica	"	"	2.8430
Alumina	"	"	.0610
Organic matter	"	"	Trace
Total			137.0348

Silurian Spring, Waukesha, Waukesha County. W. S. Haines, analyst.

Calcareous.

Sodium bicarbonate	grains	per gallon.	0.03
Calcium carbonate	"	"	9.93
Magnesium carbonate	"	"	6.83
Iron carbonate	"	"	0.13
Sodium sulphate	"	"	0.29
Iron and Manganese phosphate	"	"	Traces
Sodium chloride	"	"	0.19
Aluminium oxide	"	"	0.59
Silica	"	"	0.70
Organic matter	"	"	Trace
Total			18.69

Vesta Spring, Waukesha, Waukesha County. G. Bode, analyst.

Calcareous.

Sodium bicarbonate	grains	per gallon.	0.41
Calcium bicarbonate	"	"	13.43
Magnesium bicarbonate	"	"	10.74
Iron bicarbonate	"	"	0.05
Sodium sulphate	"	"	0.55
Sodium chloride	"	"	0.30
Aluminium oxide	"	"	0.13
Silica	"	"	0.85
Total			26.46

Waterloo Mineral Well, Waterloo, Jefferson County. G. Bode, analyst.

Indifferent.

Calcium bicarbonate	parts in	1,000.	0.24
Magnesium bicarbonate	"	"	0.28
Magnesium sulphate	"	"	0.21
Sodium nitrate	"	"	0.64
Sodium chloride	"	"	0.42
Calcium chloride	"	"	0.51
Magnesium chloride	"	"	0.13
Lithium chloride	"	"	0.02
Silica	"	"	9.02
Total			11.47

Sparta Mineral Wells, Sparta, Monroe County.
Magnetic Well. J. M. Hirsh, analyst.

Chalybeate.

Sodium carbonate	grains	per	imp.	gallon.
Calcium carbonate	"	"	"	
Magnesium carbonate	"	"	"	
Barium carbonate	"	"	"	
Strontium carbonate	"	"	"	
Lithium carbonate	"	"	"	
Iron carbonate	"	"	"	
Sodium sulphate	"	"	"	
Calcium sulphate	"	"	"	
Potassium sulphate	"	"	"	
Sodium phosphate	"	"	"	
Aluminium phosphate	"	"	"	
Sodium chloride	"	"	"	
Calcium chloride	"	"	"	
Silica	"	"	"	
Ammonium and Manganese carbonate, Hydric sulphide and Sodium iodide	"	"	"	T
Total				

White Rock Spring, Waukesha, Waukesha County. G.
analyst.

Calcareous.

Sodium bicarbonate	grains	per	gallon.
Calcium bicarbonate	"	"	
Magnesium bicarbonate	"	"	
Sodium sulphate	"	"	
Sodium chloride	"	"	
Silica	"	"	
Total			

Park Spring, Lake Mills, Jefferson County. W. W. Da
analyst.

Indifferent.

Calcium bicarbonate	grains	per	gallon.
Magnesium bicarbonate	"	"	
Iron bicarbonate	"	"	
Silica	"	"	
Alumina	"	"	
Total			

Artesian Well. G. Bode, analyst.

Indifferent.

Calcium bicarbonate	parts in	1,000.	0.07
Magnesium bicarbonate	"	"	0.01
Iron bicarbonate	"	"	0.01
Magnesium sulphate	"	"	0.04
Sodium chloride	"	"	0.01
Calcium chloride	"	"	0.01
Silica	"	"	0.01
Total			0.16

Tellulah, or Harriman's Mineral Springs, Appleton, Outagamie County. G. Bode, analyst.

Indifferent.

Sodium bicarbonate	parts in	1,000.	0.05
Calcium bicarbonate	"	"	0.08
Magnesium bicarbonate	"	"	0.06
Iron bicarbonate	"	"	Trace
Sodium sulphate	"	"	0.02
Sodium chloride	"	"	0.01
Silica	"	"	0.02
Organic matter	"	"	Trace
Total			0.24

Unanalyzed, at least no published analysis, but characterized as:

Sulpho-chalybeate: Artesian well, Oil City, Monroe County.

Calcic: In Empire Township, Fond du Lac County.
At Lovers' Glen, Brooklyn Township, Green Lake County.
At Delavan, Walworth County.
In Hartford Township, Washington County.
In Walworth Township, Walworth County.
In Taycheedah Township, Fond du Lac County.
In Whitewater Township, Walworth County.

Chalybeate: In Ahnapee Township, Kewaunee Count.
In Byron Township, Fond du Lac County.
In Empire Township, Fond du Lac County.
At Grand Chute, Walworth County.
In Herman Township, Dodge County.
In Hortonia Township, Outagamie County.
In Lake Mills Township, Jefferson County.

In Whitewater Township, Walworth County.
Norwalk Mineral Well, Norwalk, Monroe County.
Sulphur Springs: Starin's Sulphur Spring, Whitewater Township, Walworth County.
William's Sulphur Spring, La Grange Township, Walworth County.
Sulphuretted: At Kaukauna, Outagamie County.
Oleson's Sulphur Springs, La Grange Township, Walworth County.
Not Characterized: Cedarburg Springs, Cedarburg, Ozaukee County.
Near Sussex, Waukesha County.
Periclasian Spa Springs, Whitewater, Walworth County.
Alloney Mineral Springs, Green Bay, Brown County.
Bethania Mineral Spring, Osceola, Polk County.
Fort Crawford Springs, Prairie du Chien, Crawford County.
Great Geyser Spring, Palmyra, Jefferson County.
Lebens Wasser, Green Bay, Brown County.
Ne-Ska-Ra Mineral Spring, Wauwatosa, Milwaukee County.
Salvator Springs, Green Bay, Brown County.
Silver Sand Spring, Milwaukee, Milwaukee County.
Sparkling Spring, Milwaukee, Milwaukee County.
St. John Mineral Spring, Green Bay, Brown County.
Wautoma Mineral Spring, Waushara County.
Almanaris Springs, Waukesha, Waukesha County.
Arcadian Spring, Waukesha, Waukesha County.

SURF BATHING AND SWIMMING.*

THE late Sir Henry Holland, who died at an advanced age, declared in his memoirs that his life had been exceptionally happy, and that he attributed much of this to the two months' holiday that he took every year. Although we cannot all be court physicians, yet most of us acknowledge the wisdom and propriety in the suggestion as to holiday diversion. Sitting in stuffy offices during sweltering weather, waiting for patients who perhaps never come, or traversing sun-baked streets in his daily rounds, the fancy of a weary physician, like that of a starving man at a barmecidal feast, turns to the fresh blue sea with its foaming rollers tossing

*"Swimming as an Agency in Hygiene and Thalasso-Therapeutics." —The Journal American Medical Association, August 7, 1897.

upon the beach, and his mind teems with recollections of Newport, Narragansett or some less favored places, that since the time Chryses wandered disconsolate and silent by the sounding main, the sea and its shores have been resorted to for health and recreation, while numerous writers of more recent date have extolled the ocean as a health resort, and have sung the praises of sea bathing.

Nearly every one knows the rejuvenating effect of a trip across the Atlantic, and the new lease of life imparted to many by a short sojourn at the seaside cannot be over-estimated. All things considered, no form of outing is superior to a course of thalasso-therapeutics, and of all the great adjuvant means or agencies that may serve alone or collectively to this medication none surpasses swimming. If the individual who goes in for this sort of thing does not swim, he should learn and be made to recognize the necessity of an easily acquired art, the educational, hygienic and therapeutic value of which is beyond question.

In the British Isles enthusiasm for this delightful amusement and useful accomplishment grows each successive year, and it is taught and practiced to an extent little realized by Americans. Indeed, it is generally agreed among populace, educators and physicians, that the advantages of learning to swim when young are incontestable. Dr. Clement Dukes, physician to Rugby School, in "Health at School," says: "I lay special stress upon the value of swimming, baths and bathing. Every school that can possibly manage it should have a place in which the boys can learn and practice swimming."

At many of the large schools in England lads are obliged to pass in swimming before they are allowed to go out in boats. This rule, established at Eton in 1840, has been effectual there in the prevention of drowning, only one case having occurred since that time, although the swamping of boats has been frequent. A yearly average of 150 boys learn to swim and pass the test.

At Harrow, where Lord Byron, of Hellespontine renown, and Sir Robert Peel learned to swim, the well-known "Duck Puddle" is the favorite place for learning and practicing the natatory art. The knowledge here acquired has served many in good stead in after life, a notable instance being the son of Sir Robert Peel when shipwrecked by night in the Mediterranean.

At Rossall, every boy, unless specially exempted on medical grounds, must practice swimming.

At Uppingham, one of the largest schools, swimming is considered of the highest importance.

Swimming is also recognized officially as a subject of instruction in the elementary board schools of England, and the London School Board recognizes swimming as a subject under their code.

Numerous swimming clubs exist all over Great Britain, among them clubs for women. The Woman's Union Swimming Club was highly commended by a woman physician a few years ago in one of the medical journals, and at least one English girls holds a record for a ten-mile swimming event.

This aquatic zeal, like the morning drum beat of the race who are its chief exponents, appears to have encircled the earth, for in distant Australia and far-away New South Wales, similar enthusiasm prevails as in the mother country. The records of the swimming associations in these colonies are among the most creditable. In New Zealand the swimming clubs as a body are endeavoring to bring about provision by education boards for organized instruction in swimming, to classify swimmers uniformly, to induce the State to issue certificates of proficiency, to promote a more general acquaintance with the steps taken to restore animation and effect rescues, and to that end give greater encouragement to long distance events and to life-saving competitions.

Great loss of life from drowning is one of the strongest arguments in favor of swimming. In the Journal, June 27, 1889, under the head of "Bathing and Boating Accidents," attention was called to the frequency of drowning, and in treating the medico-legal relation of death from submersion, the chapter in Witthaus and Becker's "Medical Jurisprudence," refers to modern statistics, which show the great development of this class of emergency. We need, moreover, only take up our morning paper at this season to see frequent accounts of drowning, which are all the more sad for the reason that most of them arise from inability to swim in circumstances where only a moderate knowledge of the art or even a few strokes would have sufficed to save life. To be sure, good swimmers are sometimes drowned, but exceptional occurrences of the kind in no way invalidate the benefits of swimming, in view of the multitudinous number who are saved through knowing how to swim. Ample proof of this statement is within the knowledge and experience of nearly every one who has lived near the water. We know personally some very poor swimmers who have thereby saved their lives, and of some valiant ones, distinguished for saving the lives of others. A few years ago an English ship off the Newfoundland Bank was run down at night by a steamer and almost

instantly sunk, when the thirteen men of the crew jumped overboard. Of this number the only one drowned was a Russian who could not swim. The others were rescued through ability to swim until picked up. At Montreal in 1893 several yachts carrying thirty-five people were capsized by a sudden squall and sunk. Every one on board, including one woman, could swim. All were rescued after the accident.

Similar instances, citable to indefinite extent, are as numerous as the works on balneology and hydro-therapeutics, subjects that in late years have been studied with such profundity as to give rise to the brief and precise term, "medical thalassology." Questions of the kind have been discussed at two congresses of thalasso-therapeutics within the last four years, one at Brussels and the other at Boulogne-sur-Mer. The discussions at these meetings show pronounced unanimity as to the action of swimming and sea bathing upon the organism, the consecutive effects leading to decongestive action of the internal organs, tonification of the skin and muscles, and in general to a tonic and vivifying action.

Briefly speaking, the hygienic indications are that children profit more from thalasso-therapeutics and support it best. Young girls at puberty with retarded menstruation from atony of the genital organs, overworked schoolboys, young women suffering from atonic sterility, and people suffering from general fatigue or languishing health are greatly benefited, but the very old profit less.

As a curative means it is incontestable that the methods of thalasso-therapeutics are in the first line as regards lymphatism and scrofulo-tuberculosis with all its manifestations, and in rachitism it is the preferable mode of treatment. Other therapeutic indications are found in the seminal losses dependent upon genital abuse, in the menstrual troubles of young girls at the epoch of puberty, leucorrhea, chlorosis, metrorrhagia; in the diseases of women, as dysmenorrhea, amenorrhea, different lesions of the uterus, uterine neuralgia, sterility, gastralgia and dyspepsia connected with menstruation. It is, moreover, indicated in convalescence and in chronic maladies, as diabetes, obesity, impaludism, provided that the patients have enough reactive force.

The marine cure is also beneficial in chronic respiratory ailments, as bronchitis, asthma, whooping-cough, emphysema and even in pulmonary tuberculosis of torpid form if treated at a Southern resort. Chronic indigestion, neuralgia, dry skin diseases and chronic rheumatism likewise may be added to the list.

The exercise of swimming, besides, acts as a counterpoise to the

more sedentary employments and physically less active life of women, and if nothing more could be said in its favor, it is of inestimable value in banishing permanently the "backache" and migraine" so prevalent in the sex. Increased activity of the heart and lungs, the action of muscles not ordinarily used, the tonic effect of cold immersion, exposure of the naked body to actinism of the sunlight and an exhilaration akin to flying are conditions that conduce to the elimination of urea and the abolition of dyspepsia and insomnia, and are superior to the tent-cure, to massage, electricity or drugs. From the less stable equilibrium of the nervous system, women are, as a rule, extremely sensitive to the tonic influence of cool or cold water, and anything which promotes this habit in them should be specially encouraged. It is authoritatively stated that there is no class of diseases in which the effects of thalasso-therapeutics are more conspicuously beneficial than in that termed nervous from whatever cause proceeding. Hence neurologists recommend swimming or sea bathing as one of the best adjuvants in the treatment of functional nervous diseases, and have the satisfaction to get most encouraging results in hypochondria, hysteria, chorea and in sexual neurasthenia.

A therapeutic agency so potent for good is not without its dangers and contraindications. If used indiscriminately it may become a species of quackery which destroys life. There are, of course, many weak people whose chest organs are in such a condition that they should not venture to swim. Heart disease, aneurysm, Bright's disease, organic disease of the central nervous system and advanced tuberculosis are contraindicated, nor should the subjects of gout or eczema with secretion be advised to take the cure.

Knowing the reconstructive power of the agencies of which we write to be undisputed, and being aware of the fact that it is easier to increase health than to diminish sickness, these remarks were meant to apply in a hygienic rather than a therapeutic sense.

The neglect to learn swimming in childhood is responsible for many flabby hearts, weak lungs and torpid minds. From the viewpoint of physical education it is clearly of the highest importance that all young persons, especially girls, be taught swimming, since we are dependent upon them for the make-up of the next generation. The smattering of physiology with other things of doubtful utility now taught girls at school is absolutely worthless, and according to high medical authority, even hurtful. A prominent

New York physician on a late visit to a well-known girls' college was invited to attend the class of physiology. The instructress, proceeding to demonstrate the uterus and ovaries, used a cat for the purpose. The class dismissed, the doctor happened to look at the cadaver, which, to his utter astonishment, proved to be a "tom-cat."

Less physiology of this kind, less piano, less algebra and other inanities that go to make up the curriculum of a girls' school, may well be put aside for more wholesome and useful instruction that shall contribute to domestic and family happiness by returning to more rational conditions. Then half the chronic diseases resulting from or aggravated by artificial habits of civilized life will disappear; domestic infidelity and divorce proceedings will be less frequent, and the increased prevalence of sexual perversion, existing at present as the disturbance of a badly balanced nervous system, will be among the diminished things of the past.

BATHERS' CRAMP.—Chapman, writing of his personal experience (Medical Record), says: "I have had cramp at times in one and both legs and in one and both ankles. When attacked in one leg it was in warm river water, and to get ashore was a comparatively easy matter. When attacked in both legs it was in the warm waters of New Bedford Harbor (Mass.), and it was with great difficulty that I reached shore by swimming on my back, both legs doubled up under me, and dragging myself up on the beach with my hands. This attack was very painful, the muscles of the legs tightly contracted, violent pains in the head, and nausea. Slight relief was experienced on the instant of dragging the leg from the water, but the pain ceased only on prolonged and vigorous massage. Cessation of local pain was followed by general debility, exhaustion, severe headaches, muscular fatigue, and slight nausea for two days. I am absolutely certain that the liability to cramp is increased by tight garters worn either above or below the knee, tight shoes or other obstructions to natural circulation. I have investigated several other cases, have dragged one person so affected out of the water, and in all there is a tendency to double up the legs, drop the head forward and bend the arms (as in writing)—most favorable conditions to a death from drowning."

HOW TO LIVE ONE HUNDRED YEARS.

WHAT PROMINENT WASHINGTON SCIENTISTS SAY.

Correspondence of The Times-Democrat.

"Are man's chances for living a hundred years increasing?" i the question which the writer lately put to a number of Unc Sam's wise doctors.

Dr. Theodore Gill, the eminent naturalist of the Smithsonian said: "Yes; the average human life is growing longer as a result o improved hygienic regulations. Human food is more nourishing and more pure. The condition of the lower classes is better, s that the average of a generation is longer."

Dr. Fletcher, the well-known anatomist, said: "The chances fo the endurance of life are increasing, as a result of continuous pro gress in preventive medicine."

Professor Otis Mason, the Government's encyclopaedia on a subjects relating to human progress, said: "Yes; it is purely a que tion of progress. The average age of a white man in Washingto is fifty years; of a native Australian negro eighteen years. Th is the key to the situation." The professor went on to say th just as progress in any manufacturing art meant the increas durability of the thing manufactured, with human progress com increased durability of the human body.

Professor W. J. McGee, the ethnologist and evolutionist, sa that the span of human life is gradually growing further and furth past the alloted three score and ten. This is a result chiefly of co stant improvement in man's nutrition. In agriculture, by artifici selection, men are improving their food daily. In the beginnir they ate the wild products of the earth and the water. Gradual they learned to put aside each year the best of the year's harve or produce for seed, and the standard thus developed graduall The earth is being made more fertile and the flesh of animals mo abundant and more nourishing. As man's nutrition is being i creased in standard, man is of course becoming healthier a longer lived.

By courtesy of the authorities of the colossal library of the Su geon-General's office—the largest medical library in this countr —the writer has been permitted to look over several hundred titl which, under the heading "Longevity," are to be printed in th great medical index which that office is preparing.

In all, several thousand cases of human life longer than a hundr years were reviewed. From among these the writer attempted t

find the hidden key to the secrets of extreme old age. Although many centenarians have had fads to which they attribute their abnormal lives, it is surprising to find how many of them have lived lives of intemperance. It has usually been pointed out by physicians that regular habits, plain food, early rising and retiring and abstinence from tobacco, alcohol and fast living of all kinds are the only stepping stones to a long life.

Noah Raby, reported as an inmate of the poor-farm at Piscataway, N. J., who is known to be 125 years old, has smoked ever since he was six years old, when he learned the habit from his mother, and says that he has drunk whisky about as long as he has smoked, although he has been drunk only three times in his life. His diet consists of stale bread and milk, whisky, and occasionally a bit of boiled fish. He sleeps sitting in a chair to prevent rush of blood to the head.

James Welsh, of Savage Mountain, Md., who is 109 years old, and who doubtless is the oldest man in Maryland to-day, is reported as having an appetite like a schoolboy's. He says he has taken his dram moderately all his life.

Alexander Freeman, a colored inmate of Sailor's Snug Harbor, N. Y., who was reported a year ago to be 110, began chewing and smoking tobacco when he was nine years old, and was still chewing at the time of the report, although he gave up smoking when he was ninety.

Richard Reddick, a Pittsburg negro, reported as living a year ago at the age of 131, as established by the record of his freedom, had a tremendous chest, and accounted for his long life by the fact that he had always been temperate in his eating and drinking, although having always used tobacco, ever since as far back as he could remember.

Sallie Morris, who recently died near Parkersburg, W. Va., aged 113, had, up to two years before her death, walked a distance of twenty-four miles one day in each week. She was an inveterate smoker, though a white woman.

Sarah Thomas, of Burryport, England, who two years ago received from the Prince of Wales a check amounting to a shilling for each of her 107 years, was described as "very fond of a well-seasoned clay pipe filled with very strong tobacco."

Betsy Saunders, who was lately reported as living in Norwalk, Conn., at the age of 105, told a visitor that she often felt wicked because she ate so much.

William Hotchkiss, who died in St. Louis two years ago at the alleged age of 140, and whose Masonic record proved him to be at least 121, had not washed himself in water for twenty-five years before his death, preferring to scour his exterior with dry sand and to occasionally stand over a brazier that his naked form might be enveloped in smoke.

One of the most picturesque examples of extreme longevity in modern times is Nicholas Savin, a Frenchman residing in Russia. His case was recently reported to the Russian Archaeological Society. A year ago he was living at the remarkable age of 128. He remembered the mob before Paris, witnessed the excution of Louis XVI., enlisted under Napoleon in 1798, when he was thirty years old, and followed the great General as a soldier and afterward as a lieutenant through Egypt, Spain and other countries until after the retreat of the great army. He was instructor of languages in a Russian school until past 100, and when last heard of was living in poverty.

"Old Parr," servant to the English Earl of Arundel, who died in 1635 at the age of 153, was the most famous of historical centenarians. He was a glutton all his life, and died from the effects of a hearty meal. He did penance for immorality when past 100, and was married the second time at 120. His diet before he died generally consisted of "subrancid cheese and milk in every form, coarse and hard bread and small drink, generally whey."

John Bayles, an Englishman, who lived to be 130, "did not eat meat for some years, living on small beer, bread, butter and sugar." Physicians who dissected him attributed his great years to his strong, fibrous heart, low stature and tremendous chest capacity.

Francis Secardi Hongo, consul of the Venetians at Smyrna, who lived to be 115, had five lawful wives, forty-nine children, and "a round number of concubines and slaves." His gray hair turned black, and he began to renew his teeth before he died. He abstained from alcohol and tobacco, and subsisted chiefly upon a little broth, "some nice little thing roasted," and fruit, which he always ate with bread. His only fault is said to have been "his being too much given to women." Henry Jenkins, the oldest Englishman of whom there is definite record, is said to have been 169 when he died in 1670. His diet was "coarse and sour." Paul the Hermit is said to have died at 113. An ancient French list of centenarians contains the names of many Roman Catholic Sisters. In this connection it may be stated that St. Patrick is believed to have

lived to be 120, and St. Anthony 105. The regular life of a nun or a priest should be productive of longevity. This French list contains many names of the nobility and aristocracy, although that class has always been counted among those suffering the poorest chances for long life. The Irish Countess of Desmond is said to have been 145 when she died, and according to Lord Bacon, renewed her teeth several times. Atilla, King of the Huns, lived to be 124, having married a beautiful princess the day before his death. Lywarch Hen, a Welsh bard, is said to have been 150, and Apollonius, a Pythagorean priest, 130. The latter, at an early age, renounced wine, women "and all sorts of flesh," discarded shoes, let his hair grow, and wore nothing but linen. St. Mungo of Wales, who always slept on the ground, is said to have been fully 165 when he died.

The opinions of physicians from all parts of the world, and of a few centenarians themselves, as to how we may live to be 100, are quite at variance and often amusing. One authority says: "All those people who became very old were married more than once, and generally late in life." "Bachelorhood," says another, "might be classed with the most unwholesome of trades and with a residence in the most unwholesome districts," as far as chances for great age are concerned. One writer endeavors to prove by statistics that bony, muscular men, with fair complexions, abundant brown hair and nervous-sanguine temperaments, have the best chances for long life. One centenarian prescribes the "breathing of the expired breath of virgins" as an elixir of life. An old lady who lived long past 100 attributed her many years to a regular diet of potatoes. Other theorists attempt to prove that extreme longevity is characteristic of mountainous regions. A Hungarian hygienist presents statistics showing that people who sleep on the first two floors above the ground have the greatest chances for long life, other things being equal. An American doctor believes that we will have good chances of reaching the span of 100 years when we drink nothing but pure, soft water. Hard water, in his opinion, makes the bones brittle, and causes the hair to fall out. An English authority presents a long argument to prove that natural death is not the result of old age, but of "a gradual process of consolidation, arising from substances which may be so far controlled as to preserve health and active life for an indefinable period." What was pointed out to the writer as possibly the most reliable treatise on the subject was that of Dr. A. Dechambre, a Frenchman, who argues that the ordinary duration of a man's life is naturally from

90 to 100 years. His argument was based purely upon scier observations. The vital process which will indicate the agein an animal is, in his opinion, the hardening of the heads of bones. In infancy they are cartilage, which gradually and formly hardens into bone. The maturing of all animals is in portion to this process. JOHN ELFRETH WATKINS, J

SING A SONG.

If you'll sing a song as you go along,
In the face of the real or the fancied wrong;
In spite of the doubt if you'll fight it out,
And show a heart that is brave and stout;
If you'll laugh at the jeers and refuse the tears,
You'll force the ever-reluctant cheers
That the world denies when a coward cries,
To give to the man who bravely tries;
And you'll win success with a little song—
If you'll sing the song as you go along!

If you'll sing a song as you plod along,
You'll find that the busy rushing throng
Will catch the strain of the glad refrain;
That the sun will follow the blinding rain;
That the clouds will fly from the blackened sky;
That the stars will come out by and by;
And you'll make new friends, till hope descends
From where the placid rainbow bends;
And all because of a little song—
If you'll sing the song as you plod along.

If you'll sing a song as you trudge along,
You'll see that the singing will make you strong;
And the heavy load and the rugged road,
And the sting and the stripe of the tortuous goad
Will soar with the note that you set afloat;
That the beam will change to a trifling mote;
That the world is bad when you are sad,
And bright and beautiful when glad;
That all you need is a little song—
If you'll sing the song as you trudge along!

—RUFUS MCCLAIN FIELDS in *Nashville America*

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THE TEMPERANCE PROBLEM.

By Christopher R. Eliot.

From The Unitarian.

It is characteristic of our present age, and very happily so, that we are coming to look at our various problems, individual and social and religious problems, in a broad way. We regard them not as isolated, but as mutually related and dependent one upon another. Each problem is the problem of the whole: of the whole man, if the question is that of an individual; of the whole social status, if the question relates to some social evil or ideal.

This method is scientific. It distrusts panaceas. It cannot believe that all the evil in the world comes from one cause. It believes in specialists, but it knows what even among reputable physicians is not always kept in mind, that local diseases are not always due to local causes, but are the symptoms of a general condition of the whole body. Treat the trouble locally, and you may do no good. What is often needed is rather rest and food and a general upbuilding of strength through the whole system. Physicians know this perfectly well, and act upon this principle. An oculist wished to perform a slight operation upon one of my eyes. He advised it, but on second thought said that it would do no harm to wait and see what nature and rest might do. He had known such things to disappear of themselves. It happened so in my case. The best equipped and most successful specialists are those who understand best the workings of the whole human body under healthful and diseased conditions, and who realize that all the parts of that body are intimately related and dependent for local health or disease upon one another and upon the healthfulness of the whole.

This principle, recognized in the physician's practice, is being applied to-day, with most excellent results, to the reformation of individuals and in our struggle for a nobler and happier society. Carroll D. Wright says that, when he hears any one begin to talk about *the* solution of the labor or social problem, he moves to adjourn. He feels, I imagine, just as the physician does when he hears some one claim to have discovered a panacea; *i. e.*, a cure for all kinds of disease. He means that it is unscientific and absurd, showing only the narrowness and ignorance of the speaker, to claim that questions and problems so complicated, so inextricably involved in the whole social life of mankind, can be settled by some one change or remedy.

The truth is that man's moral and religious life, as well as his physical, is organic. The truth is that the life of society, of mankind, is organic. If you wish to make a man, you must do more than feed his mind with knowledge, more than stimulate his emotions, more than cure him of certain faults and drive out certain devils. You must do all these things, and many more. You must build up the whole man. You must minister to body and mind and soul. A man is a true man in proportion as he is truly related to the universe, which includes nature and man and God. He is to know and feel; he is to think and love; he is to work and worship; he is to watch and pray. The school, the workshop, the home, the church, all are to contribute elements to his character, in order that he may be complete. The head may not say to the heart, "I have no need of thee"; nor can either look with contempt upon the body. Thought is essential to give an object for feeling. Feeling is essential to give motive power to thought.

Knowledge and faith are necessary to each other. The spiritual man is manifold, and yet one, an organic unity. Neglect one phase of his activity, and all the rest suffer. *Wholeness* and *holiness* are thus synonymous.

Likewise is it true that society is an organism, an organic body. Paul was scientifically right when he wrote, "We are members one of another."

It would be very interesting and instructive to ask how much in a man at twenty-five years of age is the result of conscious effort on his part, and, on the other hand, of the unconscious influence of the social conditions and atmosphere in which he has lived. What forces have produced him? How many men, how many institutions, themselves the resultants of myriad forces, how many inventions and discoveries have contributed, without conscious effort on his part, to his knowledge, comfort and character? Professor Muirhead points out the absurdity of talking about self-educated or self-made men. We are the product of society past and present. Even the greatest and most original of men only voice the spirit of their age and are the product of the centuries. Thus the individual life is related to the whole.

Again, the health or the disease of any portion of society affects for good or evil the other portions.

The low standard or evil habits of the rich demoralize the poor. The false standards of the privileged classes, so called, drag after them, in servile imitation, those who cannot afford to spend money

wastefully upon gaudy clothes and expensive pleasure. The presence of an unhappy, unhealthy, ignorant and morally uncultivated people in the midst of a great community, which is too apt to be the condition in our great cities, reacts upon the happiness and health of the whole. More than this, evils in one department of our common life taint and poison and destroy the good in others. For example, corruption in politics directly affects a city's health, its school life, and thus indirectly reacts upon the physical and moral condition of all the people. Hence, no truly enlightened city can afford to have slums. It would pay, if not in dollars (and in the long run it would pay even in dollars), then in health, in character, all through the community, to buy up and abolish slums, and then to prevent by stringent legislation their growth. But corruption in politics and slums in city life are but symptoms of a popular indifference to high ideals of citizenship and city life. They spring from false or partial notions of duty. They are, at least in part, the result of an excessive individualism, a wrong idea of the individual's relations to the city or State, which cultivates selfishness and the *laissez-faire* kind of citizenship.

Much is to be laid at the door of a narrow-viewed political economy, but much more to the individualistic tendencies of our free and successful American life, which have encouraged an excessive independence in the citizen, educating him to "go-as-you-please" methods, and leading him to isolate his life from the life of the State.

From this stage of development we are emerging, warned by the evils it has fostered. We begin to see that there can be no healthy individual life while the social life is diseased. We begin to understand that the individual is to find his good in the common good, and that he owes to society his best as but a just return for what he daily receives. We begin to realize that the people as a whole have rights, and that the State, representing the people, may do far more in securing these rights as contrasted with the privileges hitherto too freely given to the few. This does not mean socialism. Nor does it mean disloyalty to the highest development of individuals. But it does mean an appreciation of the larger problem of society, the recognition of this problem in its wholeness, as a problem which concerns not one or two, but all, not one or two special evils, but the general character of the social State. It means the growth of a social conscience and a social ideal.

This may seem a very long introduction to the subject of te perance, and perhaps some may think it irrelevant to a discussi of the temperance problem. But it is of extreme importance secure first of all the right point of view, to establish first of this idea of the social organism and the true place of the individu therein.

For temperance is one of those problems which reformers hav isolated from other problems of life. That is a serious mistak It must be brought back to its true place among the rest, an viewed in its relationship to them.

You would think, to hear some men and women talk, that the is no other moral question worth thinking about, and that, if w could make all men total abstainers, the kingdom of heaven woul immediately come.

I confess that it would be a mighty step in that direction. I co fess that intemperance is an evil so gigantic that we cannot beg to comprehend it in all its horror and disastrous results.

But this way of looking at it as the one great problem, as if were isolated from other problems, has been a fruitful source error, leading to serious mistakes as to the causes of intemperan and the best remedies for its cure.

The most hopeful sign I see to-day in this business is not an i crease of fanaticism and excited emotion, but a disposition on t part of sober-minded and able minds to study the subject in wholeness, as a problem touching life at many points and resulti from many conditions of society. This study may not alwa lead men to right conclusions, but that is of small moment in co parison with the willingness on the part of scientific students sociology to give to the question an all-round investigation as integral part of the social life of mankind. It has dawned up men's minds at last that this is too large a question to be left to t untrained minds of earnest ministers or newspaper reporters, b that expert statisticians and chemists and physicians and sociol gists and statesmen must handle it, in its various departments, a give careful study to the various experiments which have be tried for its solution. We cannot but rejoice in the fact that t Department of Labor at Washington has been assigned to t duty of gathering statistics in regard to the liquor traffic and son of the sociological phases of this problem. We rejoice also th the national and State governments have so carefully investigat the Norwegian system of controlling the liquor business.

Again, it is good cause for satisfaction that such men as those upon the "Committee of Fifty" are at work investigating some of the physical and social and ethical aspects of the subject not possible for the Government to undertake. We rejoice in all this, not simply on account of the hoped-for results in the shape of knowledge, but because the very fact of such methods being adopted by such men shows that the whole problem is being taken out of its isolation and brought into relation with the general upward movement of the modern world.

Thus the hope of ultimate solution becomes vastly brighter. Reformers may have to work upon longer lines, and the goal may thus appear to be removed to a greater distance; but the probability of a successful issue will have been greatly increased, and the permanency of the result will have been assured.

To illustrate more clearly what I mean, let me point out the relationships of the temperance question. These appear the moment we ask, "Why do men drink liquor?" or "Why do saloons flourish?"

Now, twenty answers may be given, and every one would introduce us to some wretched phase of our incomplete civilization. For example, we are accustomed to say that drinking is the cause of poverty, which is true; but the converse of this is also true—poverty is the cause of intemperance.

Men drink because they are poor. Men drink because they have wretched homes. Men drink because they are unhappy. Men drink because they are insufficiently fed, poorly nourished, and have food they cannot enjoy. Men drink because they are not physically strong and healthy. Men drink because they crave sociability and like to meet one another under social and pleasant conditions. Men drink because they are out of work and have lost hope. Men drink because they have inherited an unhealthy or unevenly balanced nervous system from parents whose habits were not good. Men drink because the pressure and excitement of the times are so great that their physical system becomes exhausted and craves a stimulant. Men drink because they are tempted at every street corner, and because so many of their fellows, their companions, drink. Men drink because they have so little amusement, so little leisure, so much grinding, wearing, treadmill, routine work to do. Men drink because their animal, brutish natures have not been subordinated to their higher intellectual and spiritual natures. Men drink because in years of self-

confidence and carelessness they awakened the appetite and formed the habit which at last became a disease, perhaps a kind of insanity destroying their self-control.

Such are some of the reasons which account for drinking and the saloon—not wholly, for I do not forget the persistency, the selfish and irresponsible and unscrupulous persistency, with which the business of liquor-selling is pushed, and the unholy and outrageous temptations thrown deliberately in men's way.

Not forgetting this, I yet say that back of this are these other reasons pointing to conditions of modern society out of which the drinking habit comes. So true is it that wretched homes, poverty, poor food, lack of work, overwork, inherited weakness, craving for pleasure and excitement, the social instinct unsatisfied, an unhealthy condition of mind and body, overcrowding, villainous tenements, the sweating system, and many such conditions—so true is it that these conditions of modern social life are responsible each in part for men's drinking, that I am convinced that intemperance is only a symptom, and not the disease itself, and that, if we are ever to get rid of it, we must go back of it, and treat these evil conditions which are its cause. This is the conviction to which many temperance workers are coming to-day.

It is this, may I venture to imagine, which has made Miss Willard something of a socialist. It is this which has led to the widening of the Woman's Christian Temperance Union work, until it embraces many of these intemperance-causing conditions in its curriculum of education and reform. For a hundred years the temperance reform has been going on, with its varied methods and aims, with its great successes and its failures too.

To-day the consumption of liquor, including beer with the rest is enormous, showing but slight diminution in the consumption of strong liquors and a great increase in the drinking of beer.

What does this discouraging statement seem to indicate?

That reformers have taken too narrow and too limited a view of the problem. That they have isolated temperance from the other virtues, and tried to solve this problem apart from the actual conditions of life as they are to-day.

It was thought sufficient long ago to rescue the drunkard; *i. e.* to deal with the drink habit after it had taken fast hold of men.

Then it was seen that this was postponing effort until too late and a moral crusade for total abstinence began. It swept in great waves over the land, and for a time it seemed as though victor

had come. But the results were not lasting. A new generation of men came upon the scene, and the old evils again appeared. Then the strong arm of the law was invoked to remove temptation, to enforce total abstinence; and it was thought possible to bring in the kingdom of heaven by this means.

That a great deal was accomplished and still is being accomplished by this legal method is gladly admitted.

But the kingdom of temperance and of total abstinence is far away as yet; and many have been the failures and disappointments in this effort to meet by legislation the appetite and determined desires of men. At last we have begun to look deeper into the problem, and to see that it is not so simple as men once thought; that no one solution, no panacea, is possible; that work must be done upon longer lines and by various methods to touch the various causes out of which the evil springs.

So does it happen that we hope for much from *education*—not simply temperance education, but an education that shall fit boys and girls to support themselves and to fill a useful place in society. Much of our present-day education does not serve directly enough this end. We need a more practical education—that is, a training of head and hand for the every-day duties of life—so that no boy or girl shall leave our public schools without knowing how to *do* something which the world wants done. This will cultivate self-respect as well as make possible self-support.

Temperance education is good, if it is so well done as to command the respect of science and ethics. The hope of the future is always in the children; and, wisely done, here is the grandest opportunity of implanting principles of hygiene and total abstinence.

I am a hearty believer in total abstinence, not only as the pathway of safety for the individual, but as his best and most effective way of entering his protest against the liquor business and the drink habit, and of exerting his personal influence over his fellowmen. I could not emphasize too strongly my faith in this and in the endeavors we are all making to increase the number of those who for their own sake and for humanity's sake shall adopt this rule of personal conduct.

I believe in using the law to remove temptation and to prevent the education of our young people in wrong habits.

I am a believer in prohibiting the saloon wherever the public will demand such a step, and will vigorously enforce it. I am a believer in the Norwegian Bill as proposed in Massachusetts, be-

cause it gave to towns and cities where the people did not fav prohibition the choice of a system of regulation which seemed me infinitely superior to the present. I felt that it would be a tr mendous advance to get the liquor question out of politics, to r move the pecuniary motive from the traffic, and to limit mor strictly the sales. It was too good a law to be acceptable.

Believing in total abstinence, believing in the use of law and i education, I yet come back to other considerations to which in th long run, I think, we must largely trust, and to the study of whic we must eventually give more and more time and thought.

Intemperance is a symptom of many humiliating conditions c modern society—not of the presence of the saloon, for the saloo itself is a symptom.

It shows that the social condition of the people is wrong.

Not long ago I heard Professor Peabody, of Harvard Univer sity, give a report of an investigation into the saloons and subst tutes for saloons in Boston. It was a startling fact that over tw hundred thousand visits are made daily to the saloons of Bosto by their patrons. It is more encouraging to find that in the var ous substitutes for saloons—reading-rooms, pool-rooms, lunc rooms, etc.—about half as many persons may be counted dail But the point of interest here is this—the thought that in som way the social instincts of the people must be provided for. The go to saloons for companionship, and to get the light and warmt and pleasure which in wretched homes they cannot find. Here indicated a great field for philanthropic and perhaps for gover ment activity. From an editorial in the Boston Herald I quote:

"The saloon meets the side of a man's life which is real, and th substitute must have the same note and tone if it is to have the sam successful appeal to human needs. It is not the drink so much a the good-fellowship which is desired; and, where free and ope clubs are provided, so that men can come together and feel a home, and can call them their own, they are more than a match f the saloon."

The city provides its public parks, its public reading-rooms, i out-of-door gymnasiums. Is it too much to hope that these ma be multiplied, and brought nearer to the people's homes? Is too much to hope that places of public amusement may yet be pr vided—indoor gymnasiums and club-rooms, with evening co certs and lectures for all who desire to attend?

The question of public baths is agitating many people in Bost

just now, and a strong feeling exists in favor of imitating the splendid examples of English cities in providing such opportunities for the people. Dr. Hartwell, director of physical culture in the Boston schools, feels that such public bath-houses would be a most effective temperance measure. The bath is recognized at Foxboro, at the Inebriate Asylum, as a wonderful agent in stimulating and reforming the men. There are thousands of people in our cities who have absolutely no satisfactory or proper bathing opportunities to-day.

Again, when we come to the question of food and the proper preparation of food, every one knows the utter ignorance of the poor and the industrial classes. Edward Atkinson has pointed out the possibilities. He and many others would testify to the reformatory value of wholesome and palatable food.

Teach the people how to cook. Teach them how to buy economically, and to get the most health-giving food.

Here is another wide and most important field for those who would break down the saloon. It is the wretched food, the half-starved and unsatisfed appetite, the poorly nourished body, that drive many a man to the saloon for drink. Would that somehow the homes of the crowded city people could be made attractive, and the conditions made healthful and happy! We should have solved in great measure our intemperance problem then.

And so we find that the temperance problem works out into the great social problem. There is no evil condition in the industrial world which does not cause or aggravate this evil.

Too many hours of labor, exhausting the strength; unhealthy conditions in factories; crowded tenements, without sunlight or fresh air; the excitement and pressure of our rushing business life; poverty and inherited disease; a degraded home life—all these, as well as the temptations and weaknesses common to rich and poor alike, are back of the temperance problem *per se*.

Is it not true, therefore, that we must look for the final solution of the problem in the solution of these other social problems? And the Church is to do its part in the work. The work of the Church is to build up Christian character. To each other virtue, temperance is related.

Build up the whole man, would you have him equal to the temptations of appetite.

Build up the whole social structure of society, purify and

strengthen it in all its parts, would you have it banish alcoholi stimulants and saloons.

You will not misunderstand me as undervaluing the direct influ ence of personal example, nor as deserting the total abstinenc method, nor as underestimating the power of legislation. Again I say, these are vital methods and immediate duties. But I am more and more deeply impressed—and this is the one thing I wish to emphasize—with the necessity of taking the all-round view of our problem, and of working it out along the lines of the religious and social development of mankind. Change the conditions out of which intemperance and the saloon evil spring, and both will disappear. Would you go to the root of the problem?

Discover the causes of the drink habit, and, if these causes are evil conditions, correct them; if they are natural cravings, no evil in themselves, minister to them in better ways. Build up the character of men and society, substituting good for evil, and the temperance problem will be solved.

GOVERNMENT LIQUOR MONOPOLY IN RUSSIA.*

The Russian Government, in adopting the system of sellin wines and liquors to the public through Government establisl ments, instead of private wine and liquor shops, wished to accon plish, according to the Minister of Finance, the following reform To better the condition of the population, to guard public morali from the corrupt influence of the low liquor saloons, and to sell the consumers pure wine and liquors, which private parties gene ally adulterate to an injurious extent.

The Russian people drink a great deal of liquor which is call "vodki." It is simply diluted rye alcohol from 40 to 60 per cer strong. Among the peasants and lower classes it is used to suc an extent that it is detrimental to their prosperity, especially those provinces where the liquor business is in the hands of u scrupulous people, who take advantage of the inebriated conditic of the peasants. When a Russian "moujik" is under the influen of liquor, he is willing to sell anything he owns regardless of pric consequently, the masses of peasants were losing their proper and the private liquor dealers were growing rich rapidly. Gover

*Consular Report, Department of State.

ment attention was called to the state of affairs, and complaints reached the late Czar Alexander III. After consideration as to how best to protect the peasants against such extortions and to liberate them from the grip of the liquor dealers, the late Emperor ordered, in July, 1894, that liquors should be sold through the Government in places where it was found necessary, and that a system, with rules and regulations, should be prepared and put into operation as soon as possible. In compliance with the imperial command, the Minister of Finance prepared a system for the introduction of such methods into twenty-five governments, which are divided as follows: The southern and southwestern, the northwestern, and the Vistula. To the first category, where the new system went into effect July 1, 1896, the following governments belong: Bessarabia, Volyn, Ekaterinoslav, Kiev, Podolia, Tauride, Kherson and Chernigov. The second region, in which the Government system will go into operation July 1, 1897, comprises the Vilno, Vitebsk, Grodno, Kovno, Minsk and Moguilev governments. The county board of the government of Smolensk asked the Minister of Finance to introduce the system of Government sale of liquors, and Smolensk will belong to the second category. The third category, where the Government sale of liquors will commence on January 1, 1898, comprises the governments of Poland.

Simultaneously with the introduction of this system of selling liquors, a special board is established, whose duties are to look after the temperance of the inhabitants, to help the Government in regulating the sale of wines and liquors, and to foster other forms of entertainment.

The Government buys 55 per cent. of the annual local production of raw spirits at prices fixed by the Minister of Finance, which are established every year separately for each locality and depend on different circumstances, such as the price of distilling materials, the cost of fuel, wages, etc.

Although nothing definite can be said as yet about the results, data from the localities where it is in operation, collected by the Minister of Finance and officials, show that the reform works favorably and is appreciated.

The rules for selling liquors in Government shops, confirmed by the Minister of Finance March 4, 1897, and officially published March 12, 1897, contain fifteen paragraphs, as follows:

(1) The sale of wines and spirits in the Government liquor sho shall be only for outdoor use and in bottles sealed with the Gover ment seal. The bottles shall be labeled with the stamp of the d pot, on which the price of liquor and of the bottle must be printe

(2) Government wine and spirits are sold at the price printed c the label, which includes the cost of the wine or liquor and of th bottle.

(3) Empty bottles, if not damaged and bearing the Governme label, stamp, and price, will be accepted by the Government liqu shopkeepers in exchange for bottles, filled either with wine c liquor, or for money, at the cost at which they were bought.

(4) The liquor shopkeepers must keep, for the accommodatio of the purchasers of the Government liquors, bottles of all the di ferent sizes. The bottles with liquors shall be placed on th shelves in regular rows, grouped according to the quality of liquor and the dimensions of the bottles. Empty liquor bottles must b kept apart from bottles filled with liquors.

(5) Liquors not of Government preparation (but sold on com mission) shall bear a special label of red color, on which the sell ing price must be printed. Bottles from such liquors are not ac cepted in return unless special instructions are received.

(6) The sale of liquors on work days is to be carried on in vil lages from 7 o'clock in the morning until 8 o'clock in the evening and till 10 o'clock in cities.

(7) On the first day of the Easter and Christmas holidays th liquor shops must be closed. On Sundays, the second and thir days of Easter and Christmas holidays, Ascension Day, Trinit Sunday, Whitsuntide, on January 1 and 5, February 2, March 2 April 23 and 27, May 6, 9, 14, and 25, June 29, July 22, August 15, and 29, September 8, 14, and 25, October 1, 21, and 22, Noven ber 14, 21, and 26, December 6, and on all local dedication day the sale shall begin at 12 o'clock (in cities and villages where the are churches, at the end of the service) and close in villages at and in cities to 10 o'clock p. m. During religious processions, r sale shall take place in Government liquor shops.

(8) No sale shall take place in Government liquor shops in v lages during the volost meetings and during the examinations the volost courts, and also in cases where special instructions a given by the Minister of Finance.

(9) Liquors are sold only for cash and are prohibited to be sc either on credit, in exchange for any kind of produce, articles, et or in return for loans. Liquors are also prohibited to be sold minors and to intoxicated persons.

(10) The Government liquor shops must be kept clean a orderly. No pictures, portraits or publications of any kind a permitted to hang on the inside walls of a Government wine shc except an image of some saint, the rules for the sale of liquors, a the regulations of the excise administration. In the evenings t shops must be well lighted.

(11) The seller must be polite, give the liquors asked for without delay, and in case any change is due, give it back with exactitude, not keeping back even a part of a copeck, under the excuse that he has no small change.

(12) If the seller is sick or absent from his shop, he must leave it in charge of some trusty person, not younger than twenty-one years of age, for whom he shall be responsible.

(13) The purchasers of liquors are required to take off their hats when they come into the shop, to behave decently, not to open wine bottles, not to drink in the shop, not to smoke, and not to remain longer than is necessary for making the purchase.

(14) The purchasers are not permitted to go into the lodgings of the seller, and are required to obey the foregoing rules.

(15) In case the purchaser disturbs quiet and order in the shop, or violates the existing laws concerning the sale of liquors, or the rules here given, the seller must immediately notify either the excise inspector or the local district curator of public temperance, who shall make out a complaint and bring the accused to answer the charge.

The official statistics in regard to the sale of spirits show that the present distillery season began with a surplus of 15 per cent. from the stock of last year. On the 1st of August last this difference amounted to 18.8 per cent. On September 1, 1896, the whole of the registered stock of spirits amounted to 7,665,071 vedros (20,749,347 gallons), against 5,987,572 vedros (16,208,357 gallons) in 1895-96, *i. e.*, 1,667,499 vedros (4,513,920 gallons), or 27.8 per cent. more.

The movement of spirits in European Russia during the first two months of the last two seasons was as follows:

Description.	1895-96.		1896-97.	
	Vedros.	Gallons.	Vedros.	Gallons.
Production	189,604	513,258	191,279	517,792
Stocks at the beginning of the season..	9,907,578	26,819,813	11,392,877	30,840,518
Total.....	10,097,182	27,333,071	11,584,156	31,358,310
Stocks, Sept. 1...	5,987,572	16,208,357	7,655,071	20,722,277
Home cons'pt'n	4,109,610	11,124,714	3,929,085	10,636,033
Export	219,300	593,645	120,470	326,112
Am't remain'g.	3,890,310	10,531,069	3,808,615	10,309,921

JOHN KAREL, Consul-General.

St. Petersburg, March 15, 1897.

A BENIGNANT AUTOCRACY.

EXTRAORDINARY POWERS OF THE NEW YORK BOARD OF HEALTH IN THE PUBLIC INTEREST.

The extraordinary power of the Board of Health which is used from time to time in the interests of the public, when purely sanitary questions do not seem to be involved, is conferred by two sections of the consolidated act which have been made a part of the Greater New York Charter. One of these sections, under which the Board of Health has been acting for years, gave to the Board authority to make laws regarding the health and comfort of the people of the city, and expressly declared that such authority was not limited to matters of health. The other section gave to the Board authority to abate public nuisances "dangerous to human life or detrimental to health." Such sweeping provisions of law give to the Board of Health almost unlimited power to protect public health and life in the city, and it has been one of the traditions of the Health Department that the power should be used carefully, without favor and with no motive of oppression.

There has been no more striking example of the use of such power in recent years than the action of the Health Board which compelled the Metropolitan Street Railway Company to stop the danger at Dead Man's Curve by the use of an improved grip. Public clamor and indictment by the Grand Jury had failed to move the railroad company, but when the Health Board passed a resolution forbidding the company from running cable cars around curve at a dangerous rate of speed there was immediate action. An amusing incident connected with the introduction of the grip which allows the cable cars to be run slowly at the curves was a conversation held between one of the railway officials and a prominent sanitary official just after the public became aware of the improvement. The railroad man said the company really was not afraid of the Board of Health, and the use of the improved grip had been intended for many months.

"We should have used the new grip without an order from your Board," he said.

"Then I can't understand why you kept on killing people so long and wanted so much to get a slice of Union Square," said the sanitary official.

Only a few days ago there was added to the Sanitary Code a section which forbids any railroad company from using cars in the city which are not under absolute control on curves, and also forbids a gripman or motorman from sending a car around a curve at a rate of speed which is dangerous to life or detrimental to health.

NOT ALWAYS MADE PUBLIC.

Sometimes the Health Board uses its power in the interests of public comfort without having its action made known to the public. Complaint was made several weeks ago that one of the largest corporations in the city was allowing a nuisance which was annoying to many residents of a fashionable part of the city, although it was difficult to show that the nuisance was a danger to health. Sanitary experts which were sent to make an investigation presented reports which made the nature of the nuisance clear, and they were placed on file. Then an official of the corporation was politely requested to have the nuisance abated, being informed at the same time that the Health Board would grant a hearing before proceeding to issue an imperative order. In a few days the nuisance was abated entirely, and the hearing was not needed.

What may happen when a corporation refuses to obey an order to abate a nuisance was shown a few years ago in the case of a gas company which continued to allow drips from its gas retorts to flow into the East River after it had received positive warning to desist. The action of the Health Board was taken after calm deliberation, and after several hearings, in which the gas company had been allowed to make all sorts of explanations and raise all possible objections. Thousands of poor people living in tenement houses near the river had suffered from the effects of a sickening odor that came from the water at times. Sanitary inspectors had made investigations and had discovered that the water at such times was covered with a thin film of scum, and the chemist had made sure that the scum was caused by the gas drips which were allowed to flow into the river when the retorts were cleaned.

Lawyers in the pay of the gas company declared that there was no way of preventing the flow of the drips into the river, and that the supply of gas would be cut off if the operations of the company were stopped, but the Health Board issued the order to stop the nuisance. The company failed to obey at first. Sanitary policemen were sent to arrest the officers of the company, and the sanitary officials were about ready to declare the gas works a public nuisance and close them down when the company surrendered.

The nuisance was abated then, and it has not been allowed to begin again.

The New York Steam Company's smoke nuisance was abated several months ago by order of the Health Board. Tall chimneys of the company's plant had been sending out dense clouds of black smoke and soot, which were blown against high office buildings. The smoke entered open windows and annoyed occupants of offices. Layers of smudge from the steam company's chimneys were deposited on desks, books and papers. The trouble arose from the burning of large quantities of soft coal in the furnaces of the steam plant. There was a loud protest, which the sanitary officers were compelled to hear. New York would be converted into another Pittsburg if the nuisance was not abated, it was said. Sanitary experts made investigations, took photographs of the smoke and made reports upon which a hearing was ordered, and then the order went forth that the nuisance must stop. It was stopped.

TROUBLE WITH THE MILK SUPPLY.

The trouble with the milk supply in this city lasted many years. In spite of frequent raids by the milk inspectors, the destruction of large quantities of skimmed or watered milk and the heavy fines which were inflicted upon the dealers who persisted in selling such milk, the trouble continued until President Wilson of the Health Board recently hit upon the plan of compelling all milk dealers to take out permits. Special legislation by the Board accomplished a decided reform. The milk dealers were obliged to tell the source of their supply and give other information of value to the department before receiving their permits, and then the Sanitary Code was amended so as to allow the revocation of permits and the driving of milk dealers out of business if they failed to comply with the requirements for the sale of pure milk. The result has been most satisfactory. The dealers have been careful to comply with the law, and the information gained from them has enabled the inspectors of the Health Department to inspect the cows and cause the destruction of cows which were afflicted with tuberculosis, thus removing a great danger from the milk supply. For the first six months of this year there has been not only a lower death rate from diarrhoeal diseases among children than ever before, but with all the increase in population the number of deaths from those diseases is less by about two thousand than in the same period of 1896. This increase in health is believed to be largely due to the improved milk supply.

Within a year the Health Board has ordered the destruction of 108 old rear tenement houses in the city which had become dangerous to the health of the people. Most of those houses have been torn down. The Board acted under the provisions of the Tenement House Law in ordering the destruction of the houses, but the work of needed reform could not have been performed so speedily except by the use of the extraordinary power previously lodged in the Board. It has been said sometimes that the Health Board has more power than the Supreme Court in dealing with the owners of tenement houses who are unwilling to keep the houses in a condition fit for human habitation. In many cases, when such owners have failed to make improvements or repairs demanded for sanitary reasons, the Health Board has sent a policeman to drive all the tenants out and keep the houses vacant until they were repaired.—New York Tribune.

SITTING DOWN.

It would seem at a glance that there is nothing profitable to be said about sitting down. The humorist by trade could manufacture some jests out of attitudes and movements, no doubt; his ingenuity works up less promising materials. But what is there for serious debate? Sitting down "comes natural"—like eating. Persons not hasty to grant that a thing must be fashioned by Providence for the use to which we put it may willingly allow that the thigh bones are padded in order that we may sit upon them without discomfort. Until lately, indeed, another purpose was assigned to those cushions. Our forefathers proved the manifest destiny of children to be whipped by the same anatomical arrangement; but logicians might call this a second cause. Anyhow, it has passed out of use. But if the operation be natural, all human creatures must sit down—and there is an end of the theory, for they do not. Reviewing, in fact, the population of the globe, it seems likely that the men and women who sit are less than ten per cent. To begin with, the millions of China and India must be excluded. Only the hundreds there turn the cushions to their destined use, so that more than one-half of mankind is excepted at a stroke! But that is not nearly all. Japan follows, with the lands and isles of the far East, Asia in general, the most part of Africa, the Indian territories of America, from the Arctic Circle to Cape Horn. When we look

closely, it appears that only Europeans, their descendants, and those whom they have instructed, sit.

The custom is not universal, even in Europe. At the time of the war neither chair nor stool, rarely a divan, could be found in a Bulgar house, outside the towns; the table was only a foot high, and the family squatted round it on the floor. The Bulgars are not people to adopt a new fashion readily. Throughout the Balkan principalities, indeed, seats are an unnecessary article of furniture for the bulk of the population; even the divan is rare in a farm-house of Albania and Montenegro. It is assumed that Turkish influence or example banished chairs and stools. That is improbable in any case; but when we observe that outside of Europe nearly all mankind squats, it becomes far more likely that these people follow the practice of their remotest ancestors. The Turk has simply arrested development at this as at other points.

Men who do not sit have two attitudes for resting; women use one of their own. Squatting "on the heels" is favored in India and China. In this position the weight of the body falls upon the toes, and to keep the balance comfortable the arms must lie over the knees, the hands dangling. A European trussed in this manner promptly feels a pain in his calves, but he can understand that habit makes it a restful posture. In fact, our colliers use it. There is a legend current in North Staffordshire referring to the embodiment of militia or volunteers—for authorities differ—early in the century. After divers eccentric maneuvers, the officer cried, "Stand at ease!" When his order had been explained, every man squatted on his heels like an Indian coolie. There is, however, a mode of resting practiced by some jungle tribes which is utterly incomprehensible. Being fatigued, these people stand on one leg and curl the foot of the other round the calf. The same extraordinary custom is seen in Africa. We ask, in bewilderment, why on earth they do not lie, or at least squat. It may be hazarded as a mere conjecture, without any pretense of justification, that they or their forefathers dwelt in swamps especially malarious. But the custom shows what unnatural usages men will devise before it occurs to them to sit down "like Christians."—New Review.

NATIONAL PARADOXES.—Somebody once remarked, that the Englishman is never happy, but when he is miserable; the Scotchman is never at home, but when he is abroad; and the Irishman is never at peace, but when he is fighting.

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MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Diththeria.—M. Souvestre presented to the Société Médicale des Hopitaux (La France Médicale, 23d of July) some remarks on a previous communication from M. Lemoine on diphtheria, which he thought gave rise to some important questions.

His researches regarding the virulence of the bacillus in its relations with the clinical forms of diphtheria are interesting, but I do not think that they give us, on this very important question, a definitive solution. They are liable to some criticism from the fact that many of the observations are incomplete, in a clinical and even in a bacteriological point of view, for M. Lemoine has not sufficiently developed the important part played by the microbes associated with the bacillus of Loffler.

I have already shown that in the union of the bacillus of diphtheria and the streptococcus, that the strepto-diphtheria was frequent and rendered the prognosis much more serious. But it is necessary to have an understanding regarding the term strepto-diphtheria.

The simple fact of finding, in the throat of a patient with diphtheria, a number of streptococci does not mean that the patient is suffering with strepto-diphtheria. Almost all throats, in fact, contain streptococci. Strepto-diphtheria is recognized only when, after adding the false membrane to serum, it produces, after twenty-four hours in the heat of a stove or other means, a well-recognized quantity of colonies of streptococci, corresponding with the colonies of bacilli of Loffler. Besides, if with proper care, a direct examination of the false membrane is made, streptococci, more or less numerous, may be found in the strepto-diphtheria, sometimes sufficiently abundant to mask the bacillus, while in a distinct case of diphtheria the bacillus exists alone. Besides, from a clinical point of view, the strepto-diphtheria is placed in evidence by unmistakable characteristics which M. Barbier has described very fully.

If the short bacillus be considered, I think it is not always found connected with true diphtheria, or at least it indicates a mild form of the disease.

M. Lemoine, in the course of his investigation, has raised a qu tion regarding the diagnosis of diphtheria, and has endeavored establish a parallel between the clinical examination and the b teriological examination, and gives the preference to the clini study. I do not well understand this distinction; the clinical exa ination, as we practice it at the present day, really employs ma methods of inquiry, all of which may unite to establish the dia nosis, and no one of them should be neglected. The bacteriologi inquiry is only a part of the clinical examination.

RESECTION OF THE PYLORUS.—M. Péan has performed a fi operation in gastrectomy (Gazette Hebdomadaire, 18th Jul Having resected the pylorus and a part of the duodenum, the su geon brought together the lips of the gastric wound, incomplet united, with the duodenum by a button of Murphy. The sutu were covered with the epiploon. Twenty-seven days after t operation the button was removed. From the first week the p tient was able to eat, and there was not any febrile reaction duri the treatment.

SAGE AN ANTIDOTE TO SWEATING.—La France Médicale, 9th July publishes the following which may interest those who are su fering from profuse perspiration from any cause, as also the profe sion.

The use of the officinal Sage (*Salvia officinalis*) has been trac back to remote antiquity. Diascarides Polonius used it in the for of wine. Eight ounces of the leaves to an amphora of boiling wir Administered in this way sage, according to him, relieved the pai of the sick, purified the blood, healed abscesses, wounds of the mo intractable nature and regulated the monthly periods. Char magne, in 812, in his "capitularies," mentions sage and recor mends its use; but it was van Swieten and Sydenham who were t first to remark the action of sage as a preventive of profuse swea ing in convalescents from acute diseases and also in preventing t free perspiration common in phthisis. Van Swieten also recor mended it in the profuse flow of milk that sometimes persists aft nursing, a trouble which very often causes in women very seve hectic fever.

The remedy having been for a time completely forgotten h been highly recommended by Trousseau and Pidaux, afterwar by Max Krahn (Greiswald, 1896). This last confirmed the asse tions of Trousseau; having taken successively increasing doses

the tincture, he complained of profuse sweating, of heat, of dryness in the mouth and of intense thirst. All inclination for work had completely disappeared. After taking a strong dose, all intellectual effort became very repulsive. Rapidity of the pulse was increased; the heart-beats were much stronger. There were sensations of vertigo and even of hallucination.

The action of sage on the nervous system has been verified experimentally by Cadéac and Albin Meunier. They class sage among the number of substances that cause epilepsy, like absinthe, hysop, etc.; it is twice as active as absinthe. As an excitant of epilepsy it acts on the bulb, for the removal of the hemispheres of the brain in animals, on which experiments were performed, did not prevent the attack of epilepsy from being produced. If the spine be divided below the bulb the muscles of the face alone are contracted. It may be said that the convulsive attack originates solely in the bulb, the spine simply propagates and conducts it. The poisonous action of sage is also very considerable.

Krahn was the first to show the anti sudorific action of sage. In 38 cases in which he employed it, principally in phthisis, articular rheumatism and leucernia, he had only two cases in which it was not efficient. The best form for use is the tincture. in doses of xx drops in the morning, and from xx to xxx drops in the evening, according to the duration and intensity of the nightsweats.

Combemale, of Lille, has also spoken strongly in favor of the tincture of sage and the results at which he has arrived are given in a thesis by Meurisse, one of his pupils. We too (M. Degug) have employed it for some time in the service of M. Hurchard, at the hospital Necker, in the form of tincture, in the night-sweats of phthisis, and we agree fully with the conclusions of Meurisse that the effect of sage is produced speedily; about two hours after its administration; its beneficial effects sometimes continue after its use has been discontinued.

Although the essence of sage is poisonous and produces epilepsy, no unpleasant effects have ever resulted from its use as described.

THE CURATIVE ACTION OF FEVER.—Löuryand Righter (Berliner Khinische Wochenschrift, No. 9, 1897) has found that all infected animals that have had their temperature raised by "heat puncture" live longer than the check animals. He concludes from this that fever is a conservative process. Most chemical antiseptics, he remarks, act at the same time as nervines and tonics, and a

few even as specifics; but antipyretic hydrotherapeutics may, b the leucocytosis to which the stimulus of cold gives rise, play a important part in combating the infection.

A MILK DRESSING FOR BURNS.—"The Chemist and Druggist states that one of its French contemporaries, the name of which i not given, favors the use of milk as a dressing for burns, to be ap plied by means of compresses. The dressing is to be renewe night and morning. Under this treatment the reduction of th size of large burns has been marked and speedy. In one instanc an extensive burn on the leg, treated in this manner for three o four days, was reduced from five inches to an inch in width. I another instance a severe burn that had been rebellious under treatment with olive oil and zinc oxide, healed rapidly under th application of milk compresses. This suggestion may serve as valuable one for country practitioners when their accustome remedies for burns are not at command.

IODIA FOR SYPHILIS.—Edward Foley, a squatter, living in a fl boat on the banks of the Mississippi river came to me about si months ago, with a case of tertiary syphilis which he had contracte about eight years ago, and suffered from syphilitic rheumatism a fecting the long bones, frequent frontal headache and recurrin sore mouth and throat. Patient had been treated with large dos of Iodide of Potassium, which would relieve the rheumatic pai but the affection would return again. After treatment had bee discontinued for a month or two Donovan's solution, Succus alte ans and other anti-syphilitic remedies were tried, but procure only temporary benefit. About four months ago I put him on fu doses of "Iodia;" under this treatment patient improved and at th present time every symptom of the disease has disappeared. I a vised him to continue using Iodia in moderate doses for anoth month or two.

S. C. MARTIN, M. D.

St. Louis, Mo., January 28th, 1892.

NEW DISINFECTANTS.—DeBuck (Bélgique Medicale, No. 2 1896; Wiener Klinische Wochenschrift, July 15, 1897), thinks th a one-to-two-hundred solution of *antinosin* fulfills all the requir ments of an antiseptic fluid in surgery; that *nosophene* has the a vantages over iodoform of being odorless, non-poisonous, and u irritating to the skin; and that *endoxin* is one of the best of the bi muth salts as a gastro-intestinal disinfectant.

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EDITOR'S TABLE.

SANITARIAN, SEPTEMBER NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

BATHS UNDER THE BRIDGE ARCHES.

Brooklyn's Civil Authorities have been singularly negligent of the legislative enactment of April 19, 1895, *requiring* the establishment of Free Public Baths, and there seems to be no power behind the law to effect its enforcement. In default of the execution of this mandate of the State, Vice President Henriques of the Bridge Trustees, suggests the utilization of the Archways of the Brooklyn Bridge terminals for Free Public Baths. "The property is now absolutely going to waste," he says, "and the bridge has really no use for it that could not be dispensed with. There has been some talk of a public market there, but that is all it has amounted to, and I think the City of Brooklyn could well afford to erect public baths on the property. I do not mean that the city should use all of the property for free baths. One could be built first and then if that is a success others could follow. A pipe could be conected with the East River and nice fresh salt water might be used in the baths and taken when the tide is high. We have plenty of power that could be utilized for that purpose, and free baths, especially in the summer time, are the best kind of charity. It would not cost a great deal of money to erect a bath and I think one would be more appreciated and would even be a better use for the property than a public market."

Yet—but by no means to detract force from Mr. Henrique's suggestion—it is difficult to conceive anything of which the people of Brooklyn are in greater need than a *clean* public market—or rather markets, for like public baths, they should be sufficiently numerous and accessible to serve the public welfare. Nor is there anything, as viewed by the SANITARIAN, to which the people are so purblind as they are to the

FILTHY DUST AND DIRT

with which the fruit and vegetables are covered that are daily served to them. Nevertheless, throughout the city, the sidewalks

of the streets, and particularly of those streets which are the mc traveled and the most dusty, are used for the display of fruits a vegetables of all sorts, regardless of the dust and dirt from wh ever source.

That food thus contaminated is a fruitful source of sickness beyond question to any intelligent observer. Yet, like the filt horse-stables and vaults and the manner of disposing of the m nure—with the odor of which the whole atmosphere of the city now tainted—this means of propagating disease appears to be t special privilege of the venders, between whom and the Health D partment there seems to be a bond of sympathy based upc reciprocal ignorance and inattention respectively. Not the leas by any means, of the benefits anticipated by the consolidation Brooklyn with New York, is the extension and efficiency of th sanitary service in regard to these and many other nuisances whic have been assiduously cultivated in Brooklyn because of th chronic purblindness and scentlessness with which the health au thorities are afflicted.

Closely allied to Mr. Henrique's suggestion for *salt water* bath and with particular reference to more effectually laying the dus since it appears to be the inalienable right of grocers and others t use the sidewalks for the display of their wares, and considering th scarcity of fresh water and the needful means of its conservatio why not also introduce Salt Water Street Sprinkling? Even as means of public economy under existing circumstances it appea to the SANITARIAN commendable. But it has other commendab qualities besides. Salt water lays the dust far more effectually tha does fresh water, and it does not dry up so quickly. The salt whic would be deposited by its use during the day would condense moi ture during the night, and in the early morning the streets wou probably be as moist as though they had had a slight sprinklin insomuch as to prevent the dust raising by the wind or the stre sweepers before the sprinkling carts are out.

Moreover, it could and should be freely used to flush the sewer for which purpose it is infinitely superior to fresh water on a count of its antiseptic and deodorant properties.

THE MEDICAL INSPECTION of the Public and Parochial Schoo of New York City, under the direction of the Health Departmen as summed up by Dr. Blauvelt, Chief of the Division, for the qua ter ended June 30, gives the result as follows:

The total number of pupils examined was 63,812, and the total number excluded 4,183.

Among those excluded were found to be 51 true cases of measles, 91 of diphtheria, 20 of scarlet fever, 11 of croup, 26 of whooping cough, 117 of mumps, 702 of contagious eye diseases, 2,735 parasitic diseases of the head and body, 93 of chickenpox, and 175 skin diseases.

The total daily average attendance for all the schools during the three months and three days was 149,520. The number of visits made to the schools by the corps of Inspectors was 14,346, and the number of schools visited daily was 217.

The report shows that, in the primary department of grammar schools 36,012 children were examined, and 2,249 excluded.

In the primary schools 13,170 were examined, and 1,021 were excluded.

In the parochial schools 9,774 were examined and 340 excluded.

In the American Female Guardian Society 2,131 were examined and 145 excluded.

In the Children's Aid Society 2,725 were examined and 428 excluded.

This report shows beyond question the importance of this bureau in its protective value to the public in general and to school children in particular.

It shows how easily the contagious diseases of children may be and are disseminated, and how indifferent parents and guardians are to the protection of their own children or others from infectious and contagious diseases in school or at home.

It is a good beginning and will doubtless lead to even more exact and far-reaching methods. The sytem thus far meets with the approbation of all school teachers, and such parents and guardians as take an interest in the health of their children.

Drs. Charles S. Bull, Henry D. Noyes and A. Grunig, have been appointed expert oculists for the examination of public school children.

PLAYGROUNDS FOR SCHOOL CHILDREN.—At the last meeting of the Board of Education for the season, held July 14th, the report of the Mayor's Commission on Small Parks was presented. After calling attention to the great importance of the work for which it was appointed, the report stated that in the opinion of the committee one of the most practical ways of obtaining playgrounds for

children in the congested tenement districts of the city was to secure the co-operation of the board in throwing open for public playgrounds the grounds around schoolhouses, and that there were seventeen schoolhouses in the district referred to with ground available for the purpose. In planning new schools the board was asked to select sites with reference to the suggestion made by the committee. It was also suggested that roof-gardens on the school buildings might help to solve the difficult question of providing the tenement districts with sufficient breathing-places, than which nothing was more important for health and character of the children.

THE SEATING OF SCHOOL CHILDREN.—At this same meeting of the Board of Education the seating capacity of school-rooms was limited by the adoption of an amendment to the by-laws providing that in all buildings hereafter erected, primary rooms shall seat only fifty pupils each, and grammar grades only forty pupils; moreover, that in the primary rooms there shall be at least ten square feet of floor space for each pupil, and in the grammar grades, at least twelve square feet.

APPOINTMENT OF ATTORNEYS FOR STATE LUNATIC HOSPITALS.—Up to the present time all the legal work in connection with the New York State Hospitals for the Insane has been carried on by the Attorney-General's Department, but at the last session of the Legislature a bill was passed providing for the appointment of a special attorney for each hospital in the State, at an annual salary of $1,200; and something of a scandal has now been created by the announcement that the State Commission in Lunacy in making their new appointments have selected members of the Legislature who were chiefly instrumental in securing the passage of the bill.

PURE MILK FOR BABIES.—The Rochester Health Department has very praiseworthily adopted a plan for the supply of pure milk to babies, similar to that of the philanthropist, Nathan Strauss, of New York, who maintains milk depots where the milk is prepared with particular reference to the needs of the babes, and where it is given to the poor. The Health Department follows the plan as far as preparing the food is concerned, and secured a large store which is used as a hygienic milk depot. While nothing is given away, the charges are only about what it costs the department to furnish the milk—two cents a pint. It is not intended to encourage pauperism and this slight cost, it is thought, will bring the baby food within the reach of all.

The milk is supplied by a farmer at Rush, from cows that are daily curried and brushed or groomed like horses, and the udders washed daily in soap and water. The cows are kept out at pasture and have pure water to drink. They are inspected weekly by the Health Department, and the milk standardized daily by the chemist in the milk department of the health office. He also makes a daily bacteriologcal examination. The milk is put in thoroughly cleansed and sterilized bottles, and made as nearly like mother's milk as possible, by adding a certain percentage of sugar, cream and water. The bottles are securely corked and sealed, and the only things left for the mothers to look after is the rubber nipples of the nursing bottles.

The trustees of the City Hospital, through the efforts of Miss Palmer, have donated the services of a trained nurse who attends at the depot all the morning, and gives any information to those who wish it on the proper care of the babies. She takes the names of people who get milk there, and if they wish it, she calls at their homes and instructs them on how to treat the infants and the proper times to feed them. There are scales at the depot where the babies can be weighed, or they can be weighed at home, and the necessary amount of daily food determined from the weight. The depot is fitted up with a gas stove, counters, etc. Hygienic beds are supplied at small cost, and mothers are taught the manner of making them for themselves of excelsior and cheese cloth. It is purposed to make it an educational institution entirely, and it is intended as much for people of means, as for the poor, and people from any part of the city may secure milk for their babies there; indeed the demand for the milk thus supplied is far from being limited to the poorer classes. It includes some of the best families of the city, and from such a distance, that a second depot has already been rendered necessary.

A little pamphlet has been published in four different languages, English, German, Italian and Hebrew telling "How to Take Care of Babies," and these are distributed free among the people who patronize the depot. In large letters on the outside cover of this book is the important advice: "Give the baby water," and "Don't feed bannnas, candy, sausage, pop-corn, crackers or anything but milk and water."

Among other things it says: Bathe the baby twice a day in a tub during the hot weather, keep it in a room with plenty of fresh air, have very little clothing on it, and do not handle it unnecessar-

ily. '*Give the baby water.*" A number of signs printed in the fo languages are hung in the depot where they can be read by all gi ing directions in large letters as to the care of baby.

This plan was agitated two summers ago by Dr. Goler. It h to be postponed for some cause at that time, but it was not giv up. The needs of the helpless infants have been specially studi by those who support the plan, and who believe that much of t sickness and death among infants may be prevented by giving the proper care and food during the hot weather. It is certain th quite feel the heat as much or more than adults and they can on make their sufferings known by feeble cries, which are often hush in death. The baby cannot tell that it needs water, that it has t much clothing, that it wants to be let alone and not so smother with caresses. Bad odors and the dust and dirt and nuisance flies and other insects it must endure unless the mother carefu protects it from these things.

HOT WEATHER AND CRIME.—Officers of the Weather Bure have undertaken an investigation of the relation of the weather crime, and it is possible that in the near future they may be able issue warning notices of the approach of crime waves.

The investigation was originated by Col. Willis L. Moore, Ch of the bureau, who believes th[illegible]ere is a close connection l tween atmospheric conditions and the physical and moral welf of the people. He has assigned to the work Dr. Phillips, who i competent physician, as well as an expert meteorologist.

Chief Moore says: "Taking in the whole country during Jar ary, February, and March there were in even numbers 1,200 s cides reported in the United States, while in July, August, and S tember there were 1,600.

"In the same period there were 1,700 murders in the cold ter as compared with 2,500 in the three hot months.

"There were 50 persons hanged or lynched in the three c months, and 113 hanged or lynched in the three hot months."

ROBOROWSKY, the Russian explorer, has discovered a place Central Asia where no rain, but only snow, falls at any ti throughout the year. He found this delightful summer resort in Thibetan Highlands at an altitude of 17,080 feet. The thermor ter on June 15 was 12° below zero, Centigrade. There was no si of life save the appearance of a few Grongo antelopes, and th were in such an exhausted condition that they passed within a f yards of the explorers without showing any signs of fear.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrahams, M. D., Health Officer, reports June: Deaths, 74—25 under five years of age. From typhoid and typho-malarial fevers, 7; consumption 8. Annual death rate, 3.64.

The City Council has at last (Register, July 25), taken action with a view to providing a wholesome water supply and a sewerage system. At a special meeting of the Council, July 23d, the following resolution was adopted:

"Whereas it is the purpose of the mayor and general council of the city of Mobile to provide for the city a waterworks plant and a sewerage system, said question to be submitted to the citizens at an election to be held August 2, 1897, the said general council pledge themselves to provide water and sewers throughout the entire city covering all the territory within said city limits, and furthermore pledge that in consideration of city water being used they will furnish water and sewerage connections for the one rate, viz: that the minimum charge for the water and sewerage shall be 50 cents per month, the latter charge to be for one hydrant in yard, and one water closet; this rate to apply to residences of three rooms and kitchen, and residences of less rooms, and that the maximum charge for residences, water and sewerage shall be the sum of $2.50 per month, and include seven openings to wit: two water closets, one hydrant in yard, one bath tub, one kitchen sink, and three stationary wash stands. For large consumers contract rate less than at present. And further pledge when said systems are completed they will employ a sanitary plumber of experience to examine all plumbing before acceptance of the work by the owner."

Birmingham, 27,178. July 27. Smallpox has taken hold of Birmingham, after previous visitations to Carbon Hill, Evergreen, Greenville, Montevallo, and other small Alabama communities. There are thirty cases here, all but one of the victims being negroes. The patients have been removed to a pesthouse on Red Mountain, and compulsory vaccination has been ordered. Free vaccination stations have been established.

This morning (Mobile Register, August 14), at 11 o'clock, a

meeting of the Board of Censors of the Dallas County Medical Association was called at the council chamber to hear from Dr. Sanders, the State Health Officer, on the way to treat smallpox should it get to Selma, and how to prevent an epidemic. He said that there were quite a number of cases in Birmingham and the eruptive disease in Montgomery had been officially pronounced smallpox; that he was on his way to Buena Vista, Monroe County, to investigate a suspicious case reported there. The machinery to cope with smallpox should a case come to Selma, was already here, and all we would have to do would be to take advantage of it; the committee on public health should be notified immediately of the presence of even a suspicious case and they ought to act at once and recommend measures to stamp out the infection. "Once you find a case," he said, "go to work immediately like you would go to put out a fire or kill a snake."

Mayor Meyer asked Dr. Sanders if he advises Selma to quarantine against infected points, and the doctor replied:

"I have not advised quarantines chiefly because the present disease is mild in form and seems to be confined to negroes principally, and I believe that no quarantine would be effective for the negroes would walk in or ride part the way and walk the rest."

CALIFORNIA.—C. A. Ruggles, M. D., President, Stockton; W. P. Matthews, M. D., Secretary, Sacramento.

San Francisco, 360,000. Reports for June: Deaths, 486—14 under five years of age. From consumption, 42; acute pulmonary diseases, 45; from zymotic diseases, 38; diphtheria (and croup) 6; typhoid fever, 4. Annual death rate, 16.2. Contagious disease reported during the month: Diphtheria, 11; scarlatina, 10; measles, 5.

Los Angeles, 107,000. Reports for June: Deaths, 133. From phthisis, 19; acute pulmonary diseases, 6. Annual death rate, 13.58. "N. B.—Of the *22* deaths from pulmonary consumption, as follows: Natives of Los Angeles, 1; natives of the Pacific Coast outside of Los Angeles, 1; from other parts, 17 (of the 17 deaths 14 had lived here less than ten years)."

COLORADO.—Denver, 160,000. William P. Munn, M. D. Health Commissioner, reports for June: Deaths, 128. Of these 29 were caused by consumption, all contracted elsewhere; 6 by acute pulmonary diseases; 1 by measles; 1 by whooping cough. Annual death rate, 9.60 (excluding phthisis contracted elswhere 7.43.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven. The Secretary's bulletin for July comprises returns from every town in the State. There were 1,225 deaths reported during the month; 247 more than in June, and 210 less than the average number of deaths in July for the five years preceding the present.

The death rate was 17.4 for the large towns; for the small towns 14.4, and for the whole State 16.6. Deaths from zymotic diseases, 356, being 29.0 per cent. of the total mortality. From diphtheria, 17; typhoid fever, 12; whooping cough, 10; measles, 6; scarlatina, cerebro-spinal fever and erysipelas, each 4; malarial fever, 20.

DISTRICT OF COLUMBIA, 276,963—88,176 colored.—Wm. C. Woodward, M. D., Health Officer, reports the mortality for five weeks ending July 31, as 612. Of the decedents 308 were white and 304 colored, the death rate being 16.5 for the white, 36.2 for the colored, and 26.3 for the whole population. The principal causes of death were: Zymotic diseases, 172; constitutional, 132; 74 were from consumption and 12 were from pneumonia. Of the zymotic class there were 6 fatal cases of diphtheria, 12 of typhoid fever, and 27 of whooping cough.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Pensacola, 15,000. B. R. Pitt, President of the Board of Health, reports for July, deaths, 20. Under five years of age, 4. Death rate, 16.0.

ILLINOIS.—L. Adelsberger, M. D., President, Waterloo; J. A. Egan, M. D., Secretary, Springfield.

Chicago, 1,619,226. A. R. Reynolds, M. D., Commissioner, reports for July: Deaths, 1,620—549 under five years of age. From diphtheria, 66; typhoid fever, 23; consumption, 179; pneumonia, 172; bronchitis, 62; measles, 17. Annual death rate, 13.73.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

Dysentery, which has been ravaging Marion, Tipton and other cities in central Indiana, has appeared in Muncie and the condition in Avondale is quite alarming. The disease first appeared about a week ago (Muncie Times, July 15), and during the hot weather it spread very rapidly. The majority of cases are among children,

but the disease is not confined to them, a number of adults being among the afflicted.

The disease resembles cholera in many respects, but is not contagious. The victim is generally taken ill quite suddenly and the suffering is intense. The cause is generally bad sanitary conditions.

The sanitary survey of the town of Darlington, Montgomery County, by the State Board of Health (Indianapolis Journal, August 5), shows the cemetery, situated on the western border of the town, to be a menace to public health. The well in the cemetery and the wells at four houses near by were found to contain the same kind of pollution. In these four houses nine cases of typhoid fever have occurred within the last two years. Houses to the east of the cemetery have been entirely free from typhoid, and their wells contain potable water. The communication of the State Board of Health further says:

"It is to be expected that diphtheria and other diseases will appear upon the opening of school in the Fall. To prevent such a calamity, or to reduce such possible visitation to the minimum, the town trustees shall thoroughly clean and disinfect the schoolhouse, clean and disinfect all out-buildings, make certain that the drinking water is pure and that it is supplied to the pupils in a proper sanitary way. Upon the opening of school the town health officer should make a medical inspection of teachers and pupils and any one afflicted with a communicable disease should be excluded."

Richmond, 20,000. T. H. Davis, Health Officer, reports for the year ending April 30, 1897: Total mortality, 248—12.4 per 1,000. Of children under five years of age there were 48 deaths.

From consumption there were 13 deaths; from acute respiratory diseases, 23; from diphtheria, 2; from typhoid fever, 6.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board Bulletin for July, reports since preceding: Diphtheria, 6 localities; scarlatina in 2; measles in 5.

Davenport, 35,000. W. L. Allen, M. D., Physician to Board of Health, reports for June, 38 deaths—8 under 5 years of age. Zymotic diseases caused 5 deaths; consumption, 4; pneumonia, 2.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored. Deaths in June, 689;

ored, 265; 263 under five years of age, 94 colored. Deaths n consumption, 68; pneumonia, 10; bronchitis, 14; diphtheria, Death rates—White, 24:04; colored, 39.75: 30.06.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. ing, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; John Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M.D., alth Commissioner, reports for May. The weather: The mean ometric pressure during June was 29.97 inches; mean tempera- e 70°; total precipitation 2.57 inches, a deficiency in precipita- n during the month of 1.39 inches; prevailing direction of wind rthwest.

Mortality 825, an increase of 178 compared with the correspond- g month of June, 1896. Of these 636 were white and 191 col- ed; a death rate of 17.65 per thousand for the former and 30.56 r thousand for the latter. The death rate per thousand for the ole population was 19.56. 39 died from infectious diseases, 72 om consumption, 45 from pneumonia, 9 from enteritis, 14 from terocolitis, 18 from Bright's disease, 31 from nephritis, 93 from olera infantum, 15 from diarrhoea, 8 from typhoid fever, 24 from stroenteritis, 2 cholera morbus, and 4 from dysentery. 365 or 1.24 per cent. of the total deaths were in children under five years age.

During the month 267 cases of infectious diseases were reported, decrease of 46 compared with the preceding month. Deaths in ublic institutions 101, of which 34 were reported as non-residents.

The contention with the health authorities of Allegheny City ver the case of leprosy, and the failure of other afforts to shirk ie duty of taking care of the patient, appear to have resulted nally, in the exercise of such humane and sanitary measures as hould have been adopted in the first place—three months before. ll efforts to get rid of the patient having failed, an unoccupied uilding on the quarantine grounds was discovered (Baltimore un, July 13), and after needful alterations, utilized for the purpose.

Cambridge, through her town council, claims some reputation s a summer sanitary resort, yet during the prevalence of an epi- emic of scarlet fever, the "commissioners"—or we know not what -take exception (Baltimore papers, July 20-26), to any action of he State health authorities to suppress the disease, or to exercise ny other authority in that town for the protection of the public

health. Though "dogs in the manger," as they appear to be, they "will not believe it possible that the State board will threaten or undertake to govern the town over our heads because such commissioners show a determination to perform their official duties according to law and their sense of right."

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of July, 1897, compared with the preceding month, cholera infantum, cholera morbus, diarrhoea, inflammation of the bowels and remittent fever increased, and measles, influenza and bronchitis decreased in area of prevalence.

For the month of July, 1897, compared with the average for July in the 11 years, 1886-1896, measles was more prevalent, and intermittent fever, cholera morbus, consumption, remittent fever, cholera infantum, erysipelas and diarrhoea were less prevalent.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of July, 1897, at 191 places, measles at 95 places, diphtheria at 47 places, scarlet fever at 52 places, whooping cough at 29 places, and typhoid fever at 27 places.

Reports from all sources show consumption reported at 2 places more, measles at 65 places less, diphtheria at 26 places less, scarlet fever at 19 places less, whooping caugh at 8 places more and typhoid fever at 1 place less in the month of July, 1897, than in the preceding month.

At the State Capitol for the month of July, 1897, compared with the preceding month, the prevailing direction of the wind was northwest (instead of west), the velocity was 1.7 miles per hour less, the temperature was 8.79 degrees higher, the rainfall was 3.83 inches more, the absolute and relative humidity were more, the day and night ozone less, and the depth of water in the observation well was 2 inches less.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, reports for May: Total mortality, 293—112 under five years of age. Annual death rate per 1,000: 12.54. Consumption, 23; pneumonia, 35; diphtheria, 12; scarlatina, 7; measles, 1. Cases reported: Diphtheria, 75; scarlatina, 35; measles, 7; typhoid fever, 1.

The unsanitary condition of the public schools has been the subject of discussion (Free Press, July 16-18), between the Boards of

Health and Education, with the probable result of an effort to follow the example of the Health Department of New York for the prevention of infectious and contagious diseases among school children, and the ventilation of the school-houses.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 516,395. Samuel H. Durgin, M. D., Chairman of Board of Health.

During the month of June there were 765 deaths, of which number, 241 were under five years of age. Annual death rate, 17.78 per 1,000. Deaths from diphtheria (and croup), 41; scarlatina, 14; typhoid fever, 9; cerebro-spinal meningitis, 24; consumption, 95. Cases reported: Diphtheria, 366; scarlatina, 206; measles, 590; typhoid fever, 23.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602. H. N. Avery, M. D., Commissioner, reports for June: Deaths, 121—31 under five years of age. Deaths: Consumption, 20; typhoid fever, 14. Annual death rate, 8.38.

St. Paul, 215,582. A. J. Stone, M. D., Commissioner. Mortality for June, 95—27 under five years of age. Deaths from typhoid fever, 1; diphtheria, 1; consumption, 12; pneumonia, 5. Annual death rate, 5.29.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for June: Deaths, 843—337 under five years of age; from zymotic diseases, 186; diphtheria, 10; whooping cough, 7; typhoid fever, 9; phthisis, 81; pneumonia, 52; diarrhoeal diseases, 122. Annual death rate, 15.7.

Commissioner Starkloff, in his war on tuberculosis, has concluded (Post Dispatch, July 17) that one of its most flourishing birthplaces is in the Chinese laundry.

"There are," he says, "100 or more Chinese laundries in the city. No one passes one of the places without turning his head on account of the stench that issues from its cavernous depths. It is evident that these places are not clean.

"More than this, nearly every Chinese laundry is an opium joint, and all classes of people congregate there, many of them putrid with disease. The clothing of customers is piled in the den and

become saturated with the foul atmosphere emanating fr motley crowd.

"It's not worth while to go into the causes, but it is a fa two-thirds of the Chinese who die in our large cities are vic tuberculosis. They not only handle the clothing of others ir ing, but after they are washed they sprinkle them for iron squirting sluices of water over them from diseased mouths.

"The hot iron will not burn the life out of the tubercu crobes that are spurted on the rough-dried garment. In fa heat breathes life into them and they thrive in the threads garment. The innocent customer wears it and the body a the insidious microbe as the pole attracts the magnetic need

"This is the reason I have ordered a thorough inspec Chinese laundries, and if they are found inimical to the health I propose to deal with them as the case deserves."

Kansas City, 175,000. E. Von Quast, M. D., Health Offi ports for May: Daths, 177—70 under ve years of age. from typhoid fever, 6; phthisis, 7; tuberculosis, 5; pneumor Annual death rate, 13.45.

NEW MEXICO.—The Territorial Board of Health met at querque, June 27, and organized by the election of the fol officers: Dr. W. R. Tipton, president; Dr. J. W. Kinsinge president; Dr. J. M. Cunningham, secretary; Dr. G. S. I day, treasurer.

NEW JERSEY.—C. F. Brackett, M. D., President, Prir Henry Mitchell, M. D., Secretary, Asbury Park.

Paterson, 107,056. J. L. Leal, M. D., Health Officer, for June: 126 deaths—48 under five years of age. Annua rate, 11.7. Deaths from diphtheria, 5; consumption, 16; monia, 1.

Newark, 230,000.—Health Officer Chandler reports for t weeks ending July 31: Deaths, 523—279 under five years from diphtheria, 11; consumption, 34; pneumonia, 11; oth piratory diseases, 13. Annual death rate, 25.6.

Hudson County (Jersey City and vicinity), 355,231.—V Varick, M. D., President.

NEW YORK.—Daniel Lewis, M. D., President, New B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for June reports that the mortal the month (9,028), is 300 less than that of June, 1896, and

200 greater than the average June mortality for the past ten years. Next to November, this is uniformly in this State the month in which the fewest deaths occur, the number of deaths being ordinarily 900 less than the average monthly mortality of the entire year. Compared with the preceding month there was a decrease of 250 deaths and a death rate of 16.75 against 17.00. The infant mortality, while below the average for June (31.5 per cent against 36.7) is 400 greater than that of May, and the zymotic mortality, by reason of increase in diarrhoeal diseases, has arisen from 10.35 per cent. of the total to 14.00 per cent.; the common average for June is, however, 20.00 per cent. There were 500 deaths from diarrhoeal diseases, against 113 in May, and against 900 in June, 1896; in the Maritime district nearly 8.00 per cent. of the deaths were from this cause, in the Lake Ontario and Western district 4.40 per cent., in the Hudson Valley district 2.50 per cent., while in the more rural districts but 0.5 per cent. of deaths were diarrhoeal, the mortality following closely the density of population; of 1,760 deaths in country towns only 20 were reported from diarrhoea. From other zymotic diseases the mortality does not vary from that reported in May, nor that of June, 1896. The 7 deaths from smallpox all occurred in the metropolis. From consumption there were 1,000 deaths, which is a slight decrease from May; this disease shows the least variation of any in its mortality, but June is ordinarily the month in which the fewest deaths occur from it. Acute respiratory diseases, which in May decreased 500 from April, have further decreased by 400 per month. There is reported increase in deaths attributed to diseases of the digestive system; other local diseases do not vary from last month. Accidents and violence caused an increased mortality, which is customary in the summer months. The mean temperature during the month was 62° (average for the entire State), or 4° below the normal, the ranges being the same as usual, from 85° to 40°. The range of the barometer was from 29.70 to 30.25. The rainfall was that of the normal generally throughout the State.

New York City, 1,995,000.—Report for June: Deaths, 3,074—1,317 under five years of age. Death rate, 18.75. Zymotic diseases, per 1,000 from all causes, 195; diphtheria, 164; typhoid fever, 19; cerebro-spinal fever, 20; consumption, 363; acute respiratory diseases, 380; diarrhoeal diseases, 235.

The Department has surprisingly returned to the old way of disposing of decayed fruit and vegetables, by dumping such stuff

at sea instead of cremating it. That some of it should be c on the shore and become a nuisance, as has happened, shoul been anticipated. So long as it remains in existence, no where it may be deposited, there is danger of its breeding d *It should be burned.*

Brooklyn, 1,100,000.—Report for June: Deaths, 1,66 under five years. Death rate, 183. From zymotic diseas 1,000, from all causes, 135; diphtheria, 93; typhoid fev consumption, 174; acute respiratory diseases, 163; diarrho eases, 141.

Foul odors from the garbage rendering establishments a ren Island are disgusting to the residents of Canarsie, a stroys it as a shore resort. Moreover, under favorable wir deed the most prevalent, the odors are wafted over Bergen Sheepshead Bay, Rockaway Park, Coney Island, Flatlanc the Twenty-sixth ward, Brooklyn. Evidently those who and conduct these garbage rendering establishments should quired to so improve their machinery as to destroy offensive ations.

Buffalo, 350,000. Report for June: Deaths, 314—93 unc years. Death rate, 12.0. From diphtheria, 12; acute resp diseases, 37; consumption, 35; typhoid fever, 5.

Hamburg Canal has been declared a nuisance by the Heal partment, and the assistance of the State Board has been i to get rid of it. Inspector Carpenter of the Health Departm ports that "the canal is not used for any purpose other than t posal of refuse, organic matter and sewage. It has been us receptacle for these materials for many years. This materi to a large extent, remained there and the condition is beyo scription. We cannot call the contents of this canal sewage is infinitely worse, principally the decomposing deposited m from sewage, and is a grave menace to public health."

Rochester, 170,000. Report for June: Deaths, 167—31 five years. Death rate, 12.0. From zymotic diseases, pe deaths from all causes, 120; consumption, 20; acute respi diseases, 13.

Albany, 100,000.—Report for June: Deaths, 141—28 five years. Death rate, 16.9. From zymotic diseases, pe deaths from all causes, 100; typhoid fever, 4; diphtheria, 3 sumption, 26; acute lung diseases, 17.

Syracuse, 120,000.—Report for June: Deaths, 120—30

five years of age. Death rate, 12.0. Zymotic diseases, per 1,000 from all causes, 165; diphtheria, 5; acute respiratory diseases, 11; consumption, 13.

NORTH CAROLINA.—George G. Thomas, M. D., President, Wilmington; Richard H. Lewis, M. D., Secretary, Raleigh.

THE ASHEVILLE, N. C., WATER SUPPLY having been recently (Charleston News and Courier, May 28) called in question, the city Board of Health have taken pains to controvert the imputation by the following certificates:

"I certify that the two samples of the Asheville city water, the analysis of which by Professor A. C. Abbott is herewith appended, were collected by me from taps on the city water mains on June 24, 1897, the water passing directly from the tap into the container and being at once sealed and packed in ice and forwarded to Professor Abbott, and the appearance of said sample of water was in nowise different from that ordinarily drawn from the city mains.

"CHAS. L. MINOR, M. D."

"North Carolina, Buncombe County, July 1, 1897.

"Personally appeared before me, J. E. Gudger, a Notary Public, in and for the county of Buncombe, State of North Carolina, Doctor Charles L. Minor, personally known to me, who maketh oath that the foregoing certificate is true. Witness my hand and notarial seal this first (1st) day of July, 1897.

"J. E. GUDGER, Notary Public."

"Laboratory of Hygiene, University of Pa., Philadelphia, June 28, 1897.

"Report of chemical analysis of a sample of water from Asheville, N. C., collected June —, 1897, by Dr. Charles L. Minor, and received June 25, 1897.

Condition of container		good condition
Condition of sample		good condition
Color		colorless
Odor and taste		odorless and tasteless
Reaction		neutral
Total solid	Parts per million.	60
Chlorine		2
Nitrogen as nitrates		0691
Nitrogen as nitrites		——
Nitrogen free ammonia		0016
Nitrogen albuminoid ammonia		0295
Organic matter		9574

"Indications: Chemically this is a 'pure' water according to classification of Dr. Chaumont. The result of the bacteriologi examination—191 bacteria per cubic centimeter—is also exc tionally good for domestic water supply. Altogether we consi the result of the examination to be indicative of a very satisfact water. "A. C. ABBOTT, Per D. H. R.'

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Prol M. D., Secretary, Columbus.

Cases of and deaths from infectious diseases reported to State Board of Health during the four weeks ending June 26, 18 Diphtheria, 92 cases, 14 deaths; scarlatina, 110 cases, 3 deat typhoid fever, 73 cases, 8 deaths; whooping cough, 71 cases deaths; measles, 1,231 cases, 7 deaths. Aggregate population presented, 1,239,461.

Cincinnati, 405,000. J. M. Withrow, M. D., Health Offi reports for June, 408 deaths—123 under five years of age. A nual death rate, 12.08. From consumption, 46; pneumonia, bronchitis, 15; zymotic diseases, 56; diphtheria, 6; typh fever, 3.

Cleveland, 350,000.—J. L. Hess, M. D., Health Officer, rep for the month of June: Deaths, 342—98 under five years. Fr diphtheria, 5; typhoid fever, 3; consumption, 17; tuberculo 20; pneumonia, 20; bronchitis, 3. Death rate, 11.73.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Ph delphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,214,256.—Theodore B. Stulb, Health Officer, ports for the five weeks ending July 31: Deaths, 2,396—1, under five years of age. From diphtheria, 98; typhoid fever, consumption, 202; pneumonia, 116; cholera infantum, 390; s latina, 38. Annual death rate per 1,000, 20.5.

July 23. The American Reduction Company's plant, Cuml land and Almond Streets, declared to be a nuisance and its remc ordered by the Board of Health.

Pittsburg, 285,000. Report for the five weeks ending July Deaths, 605—347 under five years of age; typhoid fever, 10; c sumption, 15; diphtheria, 3; diarrhoea, 153. Death rate, 21.9.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colo 36,295. H. B. Horlbeck, M. D., Health Officer, reports for f weeks ending July 24: Deaths, 130—104 colored. Under years of age, 53. Annual death rate—white, 11.7; colored, 3 25.5.

TENNESSEE.—J. A. Albright, M. D., President, Somerville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin for July reports: The principal diseases, named in the order of their greater prevalence in the State for the month of June, were malarial fever, dysentery, typhoid fever, diarrhoea, consumption, whooping cough, measles, lung diseases acute, scarlet fever, diphtheria, rheumatism, mumps, meningitis, and smallpox.

WASHINGTON.—Seattle, 60,000.—R. M. Eames, M. D., Health Officer, reports for June, 35 deaths. Annual death rate per 1,000, 7.0. Deaths from consumption, 6; pneumonia, 4; typhoid fever, 2.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

The sixteenth report of the Board covering the biennial period ending September 30, 1896, sumarizes the proceedings of the Board in dealing with outbreaks of epidemic and infectious diseases from time to time in various places, in promptly bringing them under control and stamping them out; and, taken altogether, showing that none of them have been allowed to prevail. Special reports on the Different State Institutions, the Conference of State Boards of Health, the Purification of the Water Supply of Ashland by Sand Filtration, and Enteric Fever, are thoroughly comprehensive of their several subjects, admitting deductions generally applicable. Sand filtration, in particular, is lucidly illustrated and especially commendable.

"Extracts from Health Officers' Correspondence" show a praiseworthy interest of physicians in practical sanitation throughout the State, but, estimated by the amounts they are paid as health officers, a contemptible appreciation of the value of services rendered for the promotion of health by the communities they serve—excepting the large cities—"$10.00 per annum, to act in emergency;" "$25.00 a year;" "$15.00 per annum;" "Health Officer receives no salary and states that he has asked for none." These are examples. Others receive from $50.00 to $250.00, in large villages; and a few in larger, $300.00, and $350.00. Many are paid $2.00 per day when actually employed. Nevertheless the health of the people is well taken care of. As already remarked, when epidemic diseases appear they are speedily stamped out. Two diseases—diphtheria and typhoid fever—have shown remarkable prevalence—as they have generally throughout

the country. Of the former, for the year ending September 30, 1895, there were 1,368 reported from 107 places, with 235 deaths, 17 per cent. For the year ending September 30, 1896, out of 670 places reporting contagious diseases, diphtheria was reported from 130 places, 2,097 cases with 410 deaths, 19 per cent. For the previous four years respectively, the mortality rates were: 25 per cent., 26.5 per cent., 27.2 per cent., 24.28 per cent. The smaller mortality for 1895 and 1896, is attributed to the use of antitoxin.

Of typhoid fever, during the year ending September 30, 1895, out of the 732 boards reporting, typhoid fever was reported as existing in 59 different localities, giving 993 cases with 144 deaths, a mortality of 14.5 per cent. For the year ending September 30, 1896, out of 670 boards reporting, this disease was reported as existing in 66 localities, giving 1,234 cases with 171 deaths, a mortality of 13.8 per cent.

For the year ending September 30, 1891, there were 1,624 cases reported with 211 deaths; for 1892, 1,135 cases with 194 deaths; for 1893, 902 cases with 172 deaths; for 1894, 1,218 cases with 147 deaths. For the year ending September 30, 1891, the disease was reported in 250 communities as compared with 59 communities in 1895. For the year ending September 30, 1892, it prevailed in 20[illegible] communities as compared with 66 communities in 1896.

Milwaukee, 275,000.—Walter Kempster, M. D., Commissioner of Health, reports for June: Deaths, 245—97 under five years of age. Annual death rate per 1,000, 10.6. Diphtheria caused [illegible] deaths; consumption, 24; acute respiratory diseases, 32.

MORTALITY STATISTICS ABROAD FOR THE SECOND QUARTER, 189[illegible]

Population, total mortality, annual death rate per 1,000, and deaths from measles, diphtheria, acute lung diseases and consumption.

Londres, 4,463,469; 47,264; 15.5; 298; 446; 2,468; 1,848. Glasgow, 714,919; 3,742 20.9; 128; 45; 730; ? Liverpool, 633,07[illegible] 3,448; 21.8; 147; 24; ?;.?. Manchester, 531,299; 3,025; 22.6; 21[illegible] 8; ?; ?. Birmingham, 505,772; 2,310; 18.3; 92; 30; ?; ?. Leeds 409,472; 1,704; 16.6; 25; 11; ?; ?. Sheffield, 351,848; 1,702; 19.[illegible] 41; 17; ?; ?. Dublin, 349,594; 2,382; 27.3; 109; 39; 397; 30[illegible] Edimbourg, 292,364; 1,819; 24.9; 236; 16; 348; 157. Belfast, 281 431; 1,695; 24.1; 37; 9; 348; 268. Nottingham, 232,942; 904; 45.5 4; 3; ?; ?. Bristol, 232,242; 914; 15.7; 2; 5; ?; ?. Bradford, 231, 260; 895; 15.5; 3; 5; ?; ?. Hull, 225,045; 868; 15.4; 1; 9; ?; ?

Newcastle, 217,555; 970; 17.8; 33; 4; ?; ?. Salford, 213,190; 1,358; 25.5; 246; 5; ?; ?. Leicester, 203,599; 773; 15.2; 2; 9; ?; ?. Portsmouth, 182,585; 662; 14.5; 9; 2; ?; ?. Cardiff, 170,063; 606; 14.3; 36; 16; ?; ?. Brightoo, 121,401, 393; 9.7; —; 1; ?; ?. Norwich, 110,154; 421; 15.3; —; 2; ?; ?. Plymouth, 97,658; 451; 16.6; 4; 3; ?; ?. Luxembourg, 19,945; 97; 19.5; —; 1; 4; 9. Amsterdam, 495,683; 2,045; 16.5; 9; 25; ? ?. Rotterdam, 288,863; 1,192; 16.5; 1; 15; ?; ?. La Haye, 191,529; 653; 13.6; —; ?; ?. Paris, 2,511,629; 11,894; 18.9; 421; 78; 1,294; 2,416. Lyon, 466,767; 2,149; 18.4; 10; 23; 261; 362. Lille, 216,276; 1,313; 24.3; 116; 5: 185; 225. Saint-Etienne, 135.784; 687; 20.2; 4; 6; 129; 94. Le Harvre, 119,470; 705; 23.6; —; 5; 59; 153. Rouen, 142,657; 762; 27.1; 8; 7; 82; 132. Reims, 108,943; 590; 21.7; 2; 2; 51; 86. Nancy, 96,306; 525; 21.8; 29; 3; 60; 84. Besançon, 57,556; 287; 19.9; —; 1; 46; 44. Berlin, 1,708,499; 7,147; 16.7; 90; 92; 662; 1,099. Hambourg, 641,780; 2,745; 17.1; —; 27; 306; 374. Munich, 418,600; 2,657; 25.4; 36; 39; 264; 376. Leipzig, 413,529; 1,828; 17.7; 6; 20; 200; 230. Dresde, 347,485; 1,710; 19.7; 2; 22; 212; 246. Cologne, 331,000; 1,726; 20.9; 1; 36; 147; 189. Francfrot-s-M, 214,889; 1,055; 17.2; 4; 9; 158; 231. Hanovre, 220,644; 948; 16.7; 5; 7; 153; 118. Madgebourg, 218,284; 1,039; 19.0; 2; 10; 103; 148. Dusseldorf. 185,911; 851; 18.3; 6; 18; 129; 98. Koenisberg, 176,320; 1,094; 24.8; 2; 17; 166; 97. Nuremberg, 168,564; 1,095; 26.0; 23; 10; 154; 250. Chemitz, 168,004; 1,062; 25.3; 17; 13; 64; 89. Altona, 150.747; 620; 16.5; —; 3; 66; 95. Charlottenbourg, 149,958; 568; 15.2; 3; 10; 90; 54. Stettin, 148,-481; 960; 25.9; 1; 6; 67; 88. Stuttgart, 146,661; 582; 15.9; 11; 10; 48; 89. Breme, 145.385; 584; 16.0; —; 9; 92; 81. Strasbourg, 139.413; 779; 22.3; —; 19; 95; 102. Barmen, 130,428; 489; 15.0; —; 68; 64. Dantzig, 127,272; 823; 25.9; 6; 20; 408; 64. Halle, 121,024; 684; 22.6; 15; 30; 99; 69. Brunswick, 119,,600; 560; 18.7; —; 84; 80. Aix-la-Chapelle, 112,793; 560; 19.9; 1; 10; 85; 69. Crefeld, 107,837; 467; 17.3; 1; 16; 69; 51. Manheim, 101,857; 571; 22.4; 16; 7; 65; 76. Essen, 101,644; 475; 48.7; 5; 12; 144; 73. Mayence, 77,643; 396; 20.4; — 2; 47; 57. Metz, 59,671; 260; 17.4; 1; 1; 24; 38. Vienne, 1,542,294; 8,893, 23.1; 433; 142; 1,484; 1,722. Bude-Pesth, 592,528; 3,551; 24.0; 68; 32; 606; 673. Pargue et faub. 369,494; 1,953; 21.1; 52; 19; 229; 335. Triest, 162,606; 986; 24.3; 7; 21; 114; 155. Lemberg, 138,298; 907; 26.2; 6; 9; 116; 232. Brunn, 101,935; 729; 28.6; 4; 11; 93; 145. Cracovie, 81,-400; 659; 32.4; 1; 9; 77; 162. Pilsen, 57,324; 344; 24.0; 10; 1; 28;

52. Linz, 51,599; 416; 32.2; —; 2; 39; 101. Copenhague, 333,-714; 1,505; 18.0; 3; 16; 140; 259. Stockholm, 267,100; 1,183; 17.7; 6; 2; 180; 221. Gothembourg, 116,000; 479; 16.5; 4; 10; 45; 85. Christiania, 192,141; 755; 15.7; 3; 7; 110; 140. St. Petersbourg, 1,267,023; 7,701; 24.3; 415; 490; 318; 943. Moscou, 988,610; 8,057; 32.6; 185; 168; 159; 800. Varsovie, 614,752; 2,593; 16.9; 17; 49; 407; 295. Odessa, 404,651; 1,867; 18.5; 6; 19; ...; 246. Naples, 545,860; 3,101; 23.0; 6; 7; 585; 457. Turin, 344,203; 1,436; 16.7; 33; 8; 192; 179. Venise, 163,254; 692; 17.0; —, 7; 114; 90. Brescia, 69,928; 465; 26.6; 1; 2; 82; .... Bilbao, 66,-956; 626; 37.4; 3; 3; 98; 66. Lisbonne, 298,903; 2,064; 27.6; 55; 15; 287; 261. Bucharest, 206,000; 1,600; 31.1; 1; 24; 245; 248. Brussels, 531,011; 2,067; 15.6; 19; 10; 272; 246. Anvers, 267,-902; 1,062; 15.7; 47; 8; 180; 124. Liege, 165,404; 589; 14.2; 2; 4; 90; 63.

For the First Quarter, 1897:

Marseilles, 447,334; 3,206; 28.7; 111; 19; 961; 189. Roubaix, 124.447; 672; 21.6; 2; 10; 140; 75. Nice, 108,227; 721; 26.6; 29; 4; 186; 65. Limoges, 77,703; 463; 23.8; —; 4; 74; 86. Grenoble, 63,805; 363; 22.8; 16; 1; 44; 40. Saint-Quentin, 48,689; 258; 21.2; —; 4; 51; 20. Triest, 162,606; 1,239; 30.5; 41; 49; 220; 177. Debreczin, 61,648; 441; 28.6; 2; 11; ...; 55. Presbourg, 58,078; 491; 33.8; 8; —; —; 63. Helsingfors, 76,276; 347; 17.2; —; 3; 71; 68. Odessa, 404,651; 2,160; 21.4; 15; 30; ...; 282. Rome, 476,917; 2,305; 19.3; 25; 11; 566; 213. Naples, 545,860; 3,679; 27.3; 13; 7; 1,082; 365. Milan, 443,252; 2,464; 22.2; 19; 42; 703; 257. Turin, 344,203; 1,525; 17.7; 15; 18; 270; 159. Genes, 211,151; 1,450; 27.5; 28; 30; 420; 119. Florence, 192,482; 1,095; 22.8; —; 3; 196; 146. Bologne, 149,088; 833; 22.3; —; 7; 158; 69. Madrid, 487,-169; 4,306; 35.4; 74; 25; 1,380; 428. Bilbao, 66,956; 657; 39.2; 24; 4; 164; 73. Lisbonne, 298,903; 2,228; 29.8; 10; 14; 355; 277. Alger.: 96,642; 543; 22.5; 2; 6; 103; 54. LeCaire, 353,188; 4,116; 46.6; 2; 29; 1,281; 301. Alexandrie, 181,703; 2,059; 45.3; 2;4 16; 437; 167. Damiette, 43,502; 331; 30.4; 70; 1; 60; 12. Suze et Ismailia, 12,406; 163; 52.6; 4; 3; 43; 6. Port Said, 10,693; 281; 105.1; 7; —; 71; 11.

Bombay, Aug. 6. Considerable alarm has been caused by the official statistics of the public health just published. They show that there were 1,071 deaths here during the past week, of which 220 were deaths from the plague. This total death rate is equal to 65.61 per 1,000, or double the normal rate.

Buenos Ayres, 720,050.—Report for April: Total deaths 992—380 under five years of age. Deaths from pulmonary tuberculosis, 117; tuberculosis in general, 18; pneumonia, 87; bronchitis, 25; other diseases of the respiratory organs, 29; typhoid fever, 33; diphtheria, 12; meningitis, 49; tetanus, 23.

Cuba. Smallpox and yellow fever continue prevalent, but by the most recent reports the deaths from these diseases in the military hospitals at Habana are less numerous.

Habana.—Deaths from all causes for the week ending July 22, 264. Annual ratio per 1,000 population, 68.9. Deaths from yellow fever, 48; smallpox, 3.

CONTEMPORARY LITERATURE.

ALASKAN NATIVES.

John Muir, the California naturalist and discoverer of the great Muir glacier, writes of "The Alaska Trip" in the Midsummer Holiday (August) Century, which is a travel number of Fort Wrangel, Mr. Muir writes:

On the arrival of the steamer most of the passengers make haste to go ashore to see the curious totem-poles in front of the massive timber houses of the Indians, and to buy curiosities, chiefly silver bracelets hammered from dollars and half dollars and tastefully engraved by Indian workmen; blankets better than those of civilization, woven from the wool of wild goats and sheep; carved spoons from the horns of these animals; Shaman rattles, miniature totem-poles, canoes, paddles, stone hatchets, pipes, baskets, etc. The traders in these curious wares are mostly women and children, who gather on the front platforms of the half-dozen stores, sitting on their blankets, seemingly careless whether they sell anything or not, every other face blackened hideously, a naked circle about the eyes and on the tip of the nose, where the smut has been weathered off. The larger girls and the young women are brilliantly arrayed in ribbons and calico, and shine among the blackened and blanketed old crones like scarlet tanagers in a flock of blackbirds. Besides curiosities, most of them have berries to sell, red, yellow, and blue, fresh and dewy, and looking wondrous clean as compared with the people. These Indians are proud and intelligent, nevertheless, and maintain an air of self-respect which no amount of raggedness and squalor can wholly subdue.

Many canoes may be seen along the shore, all fashioned alike, with long, beak-like sterns and prows, the largest carrying twenty

or thirty persons. What the mustang is to the Mexican vaquero the canoe is to the Indian of the Alaska coast. They skim over the glassy, sheltered waters far and near to fish and hunt and trade, or merely to visit their neighbors. Yonder goes a whole family, grandparents and all, the prow of their canoe blithely decorated with handfuls of the purple epilobium. They are going to gather berries, as the baskets show. Nowhere else in my travels, north or south, have I seen so many berries. The woods and meadows and open spaces along the shores are full of them—huckleberries of many species, salmon-berries, raspberries, blackberries, currants, and gooseberries, with fragrant strawberries and service-berries on the drier grounds, and cranberries in the bogs, sufficient for every worm, bird, and human being in the territory, and thousands of tons to spare. The Indians at certain seasons, roving in merry bands, gather large quantities, beat them into paste, and then press the paste into square cakes and dry them for winter use, to be eaten as a kind of bread with their oily salmon. Berries alone, with the lavish bloom that belongs to them, are enough to show how fine and rich this Northern wilderness must be.

THE VARIED CLIMATE OF HAWAII.

To meteorology is given a Fortunatus choice. Every gradation of temperature, altitude, and humidity, with varying force and volume of wind currents, is presented in the Hawaiian Islands, while many subtle potencies pervade the atmosphere from sea to mountain top. Moreover, each grove, beach, vale, summit, and belt of land preserves its respective climatic attributes almost unchanged throughout the year.

Thus it is possible for invalid or epicurean to select a climate, or to change it as often as may be desired. Something like the rotation of the seasons in "temperate" latitudes may be had with no danger of meeting those sudden lapses of temperature so shocking to sensitive organizations.

Each of the principal islands is an immense but extinct volcano. Only one active crater exists—Kilauea, on a spur of Mauna Loa, on Hawaii. A charming laboratory imbedded in ferns, it serves as an escape-valve, its dangerous freaks easily avoided—in fact, these are quite under the control of the friendly goddess Pele. As the traveler gradually ascends, he finds the air becoming cooler and usually clearer with the increasing elevations and the cooler temperature often as equable as the warmer at the base of the mountain island. By way of illustration; a few hours' ride from the

ot marge of Kawaihae, on Hawaii, palm-fringed, and with the ıermometer ranging between 80° and 92° Fahrenheit, brings the orseman well up the plains of Waimea, a region keenly inspiring) every sense. Here the air, save for a short rainy season, is clear nd quite sharp with occasional frosts. Over the mountain-side ɔam immense herds of cattle and wild horses; the pursuit of these ; the chief occupation of natives, and of whites whose noble mus- ular development is clearly the effect of a lawful tonic in the mode f life.

On island Maui, at an elevation of four thousand feet, is a belt of ırge sugar plantations. In these little worlds of varied industrial equirements hospitality is generously dispensed. Here the cli- ıate is ideally delightful—sufficiently cool, while yet no frosts nor hilling winds are ever known. Through admirably irrigated rass tracts multitudes of violets appear, with many another flower nd fruit of New England, growing at peace with their tropic-born omrades. Perhaps nowhere else out of doors will so varied a col- ection of plants thrive.—From "Hawaiian Island Climate," by C. '. Nichols, M. D., in American Monthly Review of Reviews for ıugust.

THE WORLD AS IT IS AND WAS.

The earth, which we find to-day bright with varied hues, vocal ıith innumerable sounds, rich in fruits and fragrant with odors, ıy for an almost incalculable period of time destitute, or all but estitute, of color, soundless save for the noise of wave and tempest, nd with no promise as yet of the rich profusion of vegetable and nimal forms that now diversify its surface and fill it with the thrill nd manifold activities of life. We often speak of man as "the eir of all ages," but not often, probably, do we pause to realize ıe significance of the word. We talk of evolution, but seldom ıake any due effort to grasp the plenitude and grandeur of the ıought. These senses of which we have the use, and each of hich brings a different world within our ken, whence are they? seems so natural to see; it seems so natural to hear, to touch, to ıell, to taste, that we forget through what slow processes, by what ı incalculable number of slight accretions and delicate modifica- ɔns these wonderful channels of knowledge and sensation have :en made for us. We go back through the ages and we come to sightless, voiceless world. For a period probably as long as all ıe rest of geological time the only forms of life were protozoa. ght was developed among the wonderful crustaceans of the Sil-

urian period, but as yet there were no organs of hearing. The first stridulation of an insect wing was heard (if it was heard) in the Devonian age, the birth epoch of the first vertebrates, fishes; but long ages had to pass before the first bee hummed over a flower or the first butterfly fluttered its wings in the sunshine.—From Editor's Table, in Appleton's Popular Science Monthly for August.

THE ADAPTIVENESS OF THE JEW.

If the critic of Juadaism desires to gauge that religion accurately, he must familiarize himself with the history of the Jew in every land; he must follow the devious windings of his record East and West. He must account for that marvelous vitality which has been his preservative, and the unexampled adaptiveness which made the Jew at home, whether he saw the Guadalquivir or the Vistula at his feet, the Thames or the Euphrates, amid the orange groves of Sicily or the plains of Arabia—an adaptiveness which he still displays as settler in Australia, South Africa, or the Argentine. The critical inquirer, too, should ascertain the Jew's record in the lands of his dispersion and his relation to the State, however insecure his right of domicile. Did the Jew originally seek a Ghetto, or was it not an enforced seclusion as if he were contamination and needed to be kept aloof from the rest of mankind? Did the Jew avoid society and mingle only with his special clan, or was not that exclusiveness fostered and maintained by civil and ecclesiastical enactment? Was the Jew always a dealer in old clo', a money lender, the pawnbroker of humanity? The French Cremieux and James Darmester, the English George Jessel and Moses Montefiore, the Dutch Godefroi and Josef Israels, the German Edward Lasker and Berthold Auerbach, the Russian Rubinstein and Antokolski, George Brandes in Denmark, Luigi Luzzati in Italy, Emma Lazarus in America are names of our time, who are but successors of illustrious leaders centuries ago in varied fields, Jews who served the State under caliph, king, and pontiff, who aided powerfully in the revival of learning, the discoveries of science, in the dissemination of knowledge and literature. The true student of Jewish history, too, must become acquainted with the inner life of the Jew and the story of the synagogue's development, its devotional and intellectual range, the growth and ramification of Jewish law and custom, which became burden and blessing both, a crown as well as a yoke.—From "Has Judaism a Future?" by Prof. Abram S. Isaacs in North American Review for August.

ame number—
VAH H. DOTY, Health Officer of the Port of New York,
stentertainingly under the title of "Quarantine Methods."
cally describes the work at the station, the process of dis-
ships, crew and passengers, and asserts that in no other
: world are stations better equipped than in the United
needs of the service better appreciated, and the obstruc-
nmerce less.

L COLOMB, R. N., presents a valuable contribution upon
gress of British Warships' Design." The Admiral is
y conversant with his subject, and the article is well worth
ince it shows the lines on which the vessels constituting
1 fleet have been constructed.

AT SEA."—Many a fishing-schooner that sails out of
r with her ensign fluttering gaily from the "main truck"
by Cape Ann, on her return from the "Banks," with her
alf-mast. A dory or two lost in the fog or run down in
ther by an ocean greyhound that no more felt the col-
i if it crushed an egg-shell—at all events, a couple of men
or Davy Jones' locker—such is only too often the tale
ack from the fishing-grounds to Gloucester, our chief
rt. Tears at parting, weeks of anxious suspense, and
ship comes home tears again for a lost husband, son, or
that story is common enough on Massachusetts Bay.
if neighbors say. "Don't cry, dearie! Perhaps some ship
l him up, and he'll come back to you," the hope is short-
.ost at sea" is a familiar line in the death-columns of the
r papers.—"On the Grand Banks and Elsewhere," by
obbe in August St. Nicholas.

ON SCHOOLS.—These schools minister to the all-round
ent of the children, for the large playrooms are utilized for
:s; the morning half-hour devoted to dancing is sure to
hearts and feet. One summer all the children were
successive days, under the care of their science teachers,
an homes of the association at West Coney Island, where
as spent in collecting various objects incident to the sea-
)n the return to the city, this day at sea furnished inex-
material for the class-room. Another year groups of the
vere taken, under competent guidance, to the Museum of
History. There is no reason why this side of the work

should not be immensely extended, in order to make more available the resources of museum and art gallery, because we are only beginning to utilize the social and educational resources of our cities. There is no reason why the very school buildings should not be used more in the evenings, under proper restrictions, because there are many kinds of meetings and entertainments for which they would be available.—From "Vacation Schools in New York," by W. H. Tolman, in American Monthly Review of Reviews for August.

HYPNOTISM is a new word for an old fact. In Europe attention was first drawn to its phenomena by Cagliostro and Mesmer, and with the latter's name came the term Mesmerism. Reichenbach was probably the first to use the names Magnetism and Animal Magnetism, and the word Hypnotism was coined by Braid, an English surgeon. It has been the subject of scientific inquiry in the Western world for about thirty years, during which period much has been learned in regard to its detail and much new light has been thrown upon the matter by the development of nurology and psycho-physiology. Nevertheless, despite science, it may be questioned if we are ahead of the East in our knowledge and application of hypnotic principles. How long they have had practical knowledge upon this subject it is very difficult to state. Dr Bjornstrom, a distinguished Swedish physician and author, says that there is a sect in Egypt which has practised hypnotism for over four thousand years.—From "Hypnotism in the Far East," by Margherita Arlina Hamm, The Hypnotist Magazine for August.

COMPARATIVE RELIGION.—The Chicago "Open Court" offers a large amount of interesting material in its August number for the study of comparative religion. Persons ignorant of the subject of Mohammedanism should by all means read the article on "The Religion of Islam," by Pere Hyacinthe Loyson, the distinguished French preacher. Pere Hyacinthe has recently visited the Moslem possessions of France, and finds the religion of Islam strikingly similar to that of Christianity. A handsome half-tone portrait of Pere Hyacinthe, which forms the frontispiece to this number of "The Open Court," together with a brief biographical sketch, will freshen in the minds of many American readers the memory of this great Frenchman.

THE GEORGIA JOURNAL OF MEDICINE AND SURGERY, Vol. I, No. 1. July 15, 1897. Large octavo, textual pages 42. Monthly, $2.00 per annum. J. B. Graham, M. D., D. E. Dudley, M. D., and W. E. Fitch, M. D,. editors and proprietors, Savannah, Ga.

This latest addition to our exchange list comes well-freighted with a dozen original contributions, together with the gist of contemporary medical literature, of practical interest to all medical practitioners. It is backed by a list of about fifty collaborators from the pink of the profession, who, considering the editorial energy manifested in this initial number, evidently have a safe security in this additional means of sustaining reputations already won, besides opening up a new field of view from the goodly city of Savannah—onward.

PUBLICATIONS RECEIVED.

Transactions of the Medical Society of the State of New York, 1897.

Report of the Illinois Society of Engineers and Surveyors, 1897.

Cremation, Disinfection, Sterilization. W. Y. Morse, 56 and 58 Pine Street, New York.

The Standard of Medical Education. J. M. Bodine, M. D., Louisville, Ky.

Relation of the Science of Medicine to Public School Education. John Punton, M. D., St. Louis, Mo.

A Study of Some Infant Foods in Comparison with Mother's Milk. R. H. Chittenden, Ph. D. New Haven, Conn.

Contributions to Surgery. Jno. A. Wyeth, M. D., New York.

Who discovered Anaesthesia? Joseph H. Hunt, M. D., Brooklyn, N. Y.

The Effect of Simultaneous Ligation of both Internal Illiac Arteries for Hypertrophy of the Prostate Gland. Wiley Meyer, M. D., New York.

Ulcers of the Cornea—Implantation of a glass Ball for the Better support of an Artificial Eye. L. Webster Fox, M. D., Philadelphia.

Original Methods for Detecting and Measuring Abduction and Adduction of the Thigh. Phil Hoffmann, M. D., St. Louis, Mo.

Report of Brooklyn Hospital for 1896.

Report of Special Committee of Brooklyn Eye and Ear H on The Abuse of the Clinic.

Report of the Cincinnati Hospital for 1896.

Report of Friends' Asylum for the Insane, Frankford. delphia.

Report of the Tree Planting and Fountain Society of Brc N. Y., for 1896.

ANNOUNCEMENTS.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION will meet at ville, Oct. 5, 6, 7, 8, 1897. The railroads will make a rou rate of one and a third fare, or probably one fare. The addı Surgery will be delivered by Dr. J. B. Murphy, Chicago; t dress on Medicine by Dr. John V. Shoemaker, Philadelphia of papers should be sent to Dr. H. W. Loeb, Secretary, St Mo.

CIVIC AND PHILANTHROPIC CONFERENCE.—A confere men and women interested in the great social, hygienic, an anthropic questions pertaining to the welfare of human socie be held at Battle Creek, Mich., October 12-17, 1897.

The following and other questions will be presented in and addresses by prominent philanthropists and educators w hope of evolving some practical methods of reform:

Methods of Municipal Organization; The Betterment of cipal Politics; Public Sanitation and Water Supply; Condi the poor and unemployed.—Are Pauperism and crime the p of our civilization.—How to eliminate the tramp from s What to do for the ex-convict. A mutual agreement b counties, cities and villages, so one municipality shall not d idle men to another. Farm Colonies and Emergency Relie Tenement House Question; Social or University Settlement School of Health. Medical Missions.—Free Baths.—I Nursing as a relief for the sick destitute poor. School Hyg How to prevent physical deterioration resulting from school Medical Inspection of pupils.—Physical cleanliness.—La and bath facilities for public schools.

S. SHERIN, Secretary,

Sanitarium, Battle Creek, M

ASTOR, LENOX AND TILDEN FOUNDATIONS

THE SANITARIAN.

OCTOBER, 1897.

NUMBER 335.

THE TUBERCLE BACILLUS—HOW IS IT COMMUNICATED?

BY HAROLD BRYN, M.D.

IT is contended by some physicians that it is too early yet to try to stop the spread of tuberculosis, because we know too little about the biology of its bacillus. It is urged by them that the bacillus tuberculosis, possibly, like the mucorina, forms spore-sacks containing spores, which when they burst scatter the spores. It is true that nobody can yet say surely that the bacillus cannot grow outside of an organism; but the tubercle bacillus, nor its spore-cells, have never yet been so found. Those bodies which have been thought to be spores, seen in the bacillus, are only granules that may be seen in the degenerated forms, most often found in the leucocytes. The bacillus tuberculosis is a vegetable organism whose place in the botanic system it is difficult to determine. But whether it is an alga or mushroom is of no significance to us in a biological aspect. The actinomycosis-mushroom, which in some regards is like the bacillus of tuberculosis, seems to form spore-sacks like the mucorinae. But nobody has ever observed the bacillus tuberculosis to form spore-sacks nor even isolated spores. The spore of the bacillus tuberculosis is yet to be found—if it exists.

The bacillus tuberculosis is a plant which, like some seaweeds, grows ramified, like a tree, and is really not a rod but a tree, with stem and branches formed of the fine jointed cells, the *bacilli*. The bacillus tuberculosis is, then, a parasite; which needs very much air and oxygen. Like the mycoderma aceti, it grows only on the surface of the culture or substratum, as a white mould-like membrane. Shaken in the culture it will sink to the bottom and die. It is not very tenacious of life, and if not frequently renewed it will die. Even in cultures it will not live more than a few months. In darkness and dampness it thrives better than in light and dryness. In

a cadaver kept in a zinc box the virus remains active after three months; eight and a half months later the bacillus can still be seen, but it is then inactive. In cold running water the bacillus remains active for two months. In a lung laid in water it was active after five months. In sputum it is active after three months. In dried sputum it usually dies within two months.

How little vital power there is in the expectorated bacillus will easily be understood, since the bacillus is not easily cultivated from the expectoration, but has to be transferred to an animal organism.

It is evident from this that the bacillus can be destroyed with comparative ease. The danger of infection from rooms unoccupied for five or six months and cleaned after having been occupied by consumptives, is perhaps doubtful. But when it is averred* that in a bed on which a man died of tuberculosis, 60 per cent of the bed bugs found in it contained virulent bacilli, as in the case reported we should be careful in our conclusions with regard to the means by which the bacillus may be preserved and transmitted. A short time after the death of the man in the case referred to, his brother sleeping in the same bed, contracted consumption, and the disease in his case was attributed to the bedbugs. But let the explanation of the means of infection be one or the other, the original source of this bacilli found so widely distributed is traceable in human or animal organisms only.

Should it now be found that Baumgarten is right in his theory that the tuberculosis is mostly inherited, then the modern preventive measures undertaken are a mistake. But the fact that so many young children, especially when they are one year old, develop tuberculosis, can be taken as evidence of infection by feeding inasmuch as they, just at this age, begin to drink milk other than that of the mother. The distinguished biologist and veterinarian Dr. Malm, above referred to, may seem to be extremely one-sided but his views are so much the more original and interesting. In a discussion about the "practicability of compulsory notification of pulmonary tuberculosis" in Norway, Dr. Malm says in substance:

"As to how the tuberculosis virus infects us as well as animals opinions are a little divergent. Not considering the infrequent conveyance through the wounded skin, sexual intercourse, etc. there are only three ways for infection: by inheritance, by inhalation with the air or by the food, through the mouth and alimentary canal.

*Dr. Malm, Norsk Magazin for Laegevidueskabin, March, 1897.

"Conveyance by inheritance is, no doubt, the least frequent of those three. This is evident, not alone from the comparative rarity with which the congenital and infantile forms of tuberculosis are found in the human race and in animals (it is only in the sixth month after birth that the disease can in general be substantiated), but also from the experience which is afforded in the great foundling hospitals in France, St. Petersburg, Munich and Nuremberg. In those places the children born of tuberculous parents are free from this disease if they are taken from the mother just after birth. It is also an important phenomenon, that the newly born and young calves are healthy, even if the whole stock is tuberculous. As inheritance, therefore, plays wholly a subordinate part, there will from this cause be no need to fear for the permanence of the tuberculosis, if the other sources can be removed. There are, then, but two avenues for infection: through inhalation and through the mouth. And, practically, with regard to the remedies in combating the disease, it is of the greatest importance to know the source of infection."

The adherents of the theory of infection through inhalation point out that the bacillus is in the dust around us and often in the noses of healthy people, and that the lungs are frequently tuberculous; and, lastly, that the bronchial glandules are often infected. But if it were a fact that the bacilli of tuberculosis were always introduced into our lungs through inhalation and in this way get their hold on the system, then we would all be tuberculous. It is not enough to say that many possess an immunity against tuberculosis, as is the case in diphtheria, anthrax, typhus, cholera, etc., and that because of this we are not all infected with tuberculosis. Diphtheria, anthrax, typhus and cholera are all acute diseases, which leave behind immunity from subsequent attacks, and they are produced by virus of which both the toxin and antitoxin are known. But although we have for six years known the toxin of the bacillus of tuberculosis, yet nobody has produced its antitoxin. Nobody has even succeeded in lessening its virulence. Here, as in leprosy, we hope only for the future, and the only way we now know is to prevent infection, and, if we are infected, to keep our bodies healthy; then our cells will destroy the bacillus, instead of the bacillus destroying us.

Let us compare this with a disease which is mostly caused by inhalation, the so-called dust-lungs (Pneumonokoniosis or Siderosis). This disease does not attack young people so long as the

epithelium in the bronchial tubes performs its duty—the inhalec dust is forced up again. Only when this "flimmer" epithelial is ex hausted and filled with dust will the lungs be attacked. Neither i it, as in tuberculosis, the upper portion of the lungs that are firs affected; for, when the dust enters the lung, it does not go into th epithelial cells, but between these into the mucous ducts and th alveolar walls and thence into the lymphatic canals, where it i gradually deposited in the peri-bronchial and peri-vascular "frame work"; at last it comes through the absorbent canals to the bron chial glandules, which are such good filters that it never goes an farther.

If, then, the bacillus of tuberculosis is so often inhaled, why i the primary tuberculosis so seldom found? Storch says that tube culosis is never primary in the nose. And why is not the bacill of tuberculosis to be found, like the fine coal dust in pneumon koniosis, all along the bronchial tubes and air-cells, but always the bronchial glandules? Has the bacillus of tuberculosis ev been found in quite healthy people's sputum? If the bacillus is often inhaled, it ought to be seen in the sputum of healthy indivi uals, and the diagnostic significance of the bacillus would be very little importance. And when Straus sees the bacillus in ni out of twenty-seven noses, without any of them being affected wi tuberculosis, this, I think, shows that inhalation of this bacillus not very dangerous. No! the few bacilli that one can inhale almc always stop in the nose and go no farther down. The inhaled a is, when it passes down to the alveoles, nearly freed from the so particles and free from microbes.

That an affection of the bronchial glandules does not absolute indicate that the infection has come from the lung, is a fact lo ago established. As early as 1853, Robin produced "dust-lung in dogs by feeding them with coal dust. I have myself injected healthy calf with vacilli of tuberculosis in the belly, with the res that a glandule in the "cavitas pectoris" was infected, while the a domen remained free. And in those cases of congenital tuberc losis in the new-born and in which infection by inhalation cann be in question, in those cases the bronchial glandules and the lun are often affected. And how can the occasionally occurring prima infection of tuberculosis in the bones, testes, brain and its me branes be explained? Either this infection is caused by direct troduction, a thing absolutely unacceptable, or the infection m have been caused through the "great circulation"—and this c

tainly occurs most frequently. As the intrauterine infection occurs but very seldom, and, if it occurs, causes its destructive influence very quickly after birth, must its introduction into the circulation take place through the lungs? It seems to me, then, much more reasonable that it is the leucocytes with the bacilli of tuberculosis within them, which go from the "lesser (pulmonary) circulation" through the capillary system into the lungs and into the "greater circulation," than that the inhaled bacilli should penetrate the lung-epithelium and advance directly into the veins of the lungs. That the top of the lung is most frequently the seat of tuberculosis does not indicate the truth of the theory of inhalation; because, if the bacilli are inhaled, why do they then come into the top of the lungs, where the least portion of the inhaled air enters? No, the cause of the frequency of apex tuberculosis is surely not that the bacilli are most frequently conveyed here, but that they here meet the least resistance. The bacillus comes into the lung, carried by the blood or lymph, but while the leucocytes in the other parts of the lung destroy or transfer them to the bronchial glandules, they can, in the apex of the anemic lung, remain undisturbed. And it must not be forgotten that it now seems to be a settled fact that tuberculosis not only belongs to the most frequent but also most curable of infectious diseases.

Turning to the defense of the theory of infection through the alimentary canal, Dr. Malm ridiculed the idea that this mode of infection must be of seldom occurrence, because primary tuberculosis of the bowels occurs so seldom and because experiments with the feeding of animals always produced primary tuberculosis of the bowels. As early as 1868, Klebs proved that feeding with tuberculous virus produces tuberculosis without affecting the intestines. Giving guinea pigs hay with tuberculous expectoration, he found swelling of the mesentery glandules and nothing more. Later on, Aufricht, Viseu and Nocard experimented on different kinds of animals with the same results.

In children, however, tuberculosis of the bowels is not so infrequent as is generally admitted. Chaveau proved that animals were infected through the food more easily the younger they were, and that with respect to calves it was enough to smear the udder with tuberculous virus to infect them. Toussaint produced tuberculosis in animals by feeding them with raw meat-juice from cows and pigs; and investigations by the English Tubercular Commission and the Agricultural Society of Massachusetts gives sufficient

proof of the danger of milk from tuberculous cows, even if t udder is not affected. The experiments in Massachusetts show that by feeding with milk from fifteen tuberculous cows (but wi healthy udders) out of forty-eight rabbits, two; of twelve you pigs, five; and of twenty-one calves, eight were infected.

It is said of a young doctor who died in Montana from tuberc losis, that he, the day before he died, expectorated in a wine-gl containing champagne, and told his young wife, sickly and jealc as he was, to follow him in death by drinking this poisoned c She did so, and died some months after from general tuberculosi

Cohn proved, in 1888, that one drop of pure culture of bac tuberculosis given to guinea pigs by the mouth was enough to p duce tuberculosis in the mesentery glandules without any affecti of the serous membrane of the bowels. And Wesener has w a probe carried the tuberculous sputum direct into the stomach animals, with the result that the mesentery glandules were infec with tuberculosis, but the serous membrane of the bowels was attacked; on the contrary, if he opened a portion of the gut and the virus directly on the membrana serosa, he got tuberculosis the gut.

Substantially, Dr. Malm thinks himself in harmony with Bau garten, Klebs, Ballinger, Arloing, Woodhead, Codeac and Ma when he concludes that tuberculosis by inhalation is comparativ rare and that the infection, in children in particular, is cau through the alimentary canal. We get our tuberculosis mo through the mouth, especially children. Dust mixed with bac of tuberculosis adheres to our fingers, our food, and what we not get in this way we get through unclean glasses, spoons, e through the milk, and, no doubt not so often, through meat.

Transmission *par rapport sexuelle debouche*, pipes, etc., are c osities. But it is significant that in late days there are *rapports* tuberculosis in the tonsils and not infrequently in carious teeth

Dr. Malm thinks that cleanliness of our persons, regarding excreta and our food will restrict the disease very much, and, p sibly, after a while practically eradicate it.

Now there are others who say that it is not yet proved t tuberculosis is at all infectious. And certainly the infectiousn of this disease cannot be proved by experiments in a laborat But those experiments that introduce the disease by inoculat support the supposition that tuberculosis is a specific dise caused by a specific bacillus, which the microscope shows. A

in the pathologico-anathomical laboratories it is further proved that these bacilli produce a "local" cellular derangement, which spreads further throughout the system. And these facts, compared with the cases more and more frequently observed of presumed infection, support the theory that tuberculosis is an infectious disease. Formerly we depended upon the theory of a diathesis or dyscrasia, and then the inheritance of the sickness seemed most probable. Now, on the contrary, we think the sickness begins locally, and then spreads further throughout the system.

It is more difficult to say when the infection takes place. It is now often supposed that every third individual at some time or other in his life must have been infected with tuberculosis. As early as 1882, Baumgarten said that he had found latent or extinct tuberculous matter in twenty-five to thirty per cent. of the corpses in which tuberculosis had not been the cause of death. And it is now a fact that a great part of the people in the civilized world go around with more or less evidence of local tuberculous processes healed in one or other organ and of older or later origin, while the foci through many years, sometimes never, make their presence known nor to any great extent have any influence on the health of the individual.

The infection mostly takes place in the three or four first years of childhood. The fact is that, in these first years the deaths directly from tuberculosis, either absolute or relative, are more numerous than later on within a like period of years. And now, if consideration be given to the many cases of scrophulo-tuberculosis in the glandules, bones and joints—so often seen in the second and third year of childhood—it will be clear that it must be specially in these first years of the childhood that the infection takes place. That this tuberculosis in childhood is not inherited is seen, among other things, from the fact that while tuberculosis as a cause of death has its absolute maximum in the first year, and, mark well! not before the last two-thirds of it, at the same time there is very little if any latent tuberculosis to be found in the other children dead in this year. On the contrary, later on, the latent glandular tuberculosis is more and more distinctly shown and increases with the age of the children.

In regard to tuberculosis in adults, it is not yet positively settled how much per cent. of them is infected in advanced age and how many must be taken as the rapid development of a latent process existing from infancy. But tuberculous processes in adults are

now more frequently interpreted as returns of the disease and cases of autoinfections, and less frequently as pure primainfections.

Brooklyn, N. Y., September 8, 1897.

VALUE OF STERILIZED MILK.

The following letter on the sterilized milk question was sent by Nathan Straus to Mayor Strong, Sept. 6:

The Hon William L. Strong, Mayor of the City of New York:

Dear Sir: I have had on more than one occasion evidences of your appreciation of the efforts which I have been making during the last five years to reduce the needless sacrifice of children's lives in this city. I am encouraged, therefore, to believe that it will not be regarded as an intrusion upon your time to ask your attention to some considerations bearing on the conduct of that work, which certain public officers in the Departments of Health and of Docks have recently forced, with disagreeable emphasis, on my attention.

I think the claim will be generally admitted that my work belongs to that class of benevolent agencies to which, among all civilized peoples, the aid and encouragement of the Government are freely extended. It is my own conviction that it is a work which in every great city of this country should be done by public authority at the public expense.

I merely express the judgment of every physician who has given the subject any attention when I say that there is no system of milk tests, either now in operation or capable of being generally applied, which is sufficient to protect the lives of young children against the noxious germs present in a large proportion of the milk delivered in its natural state in this city. I regard it as simply criminal, and in this, too, I have competent medical authority to back me, to feed children of tender age with milk which has not been Pateurized.

My work in placing prepared milk food for infants within the reach of the poorest, and in giving it away to those who have not the required penny to spend, may thus be reckoned as a valuable aid to the efforts of the Board of Health to guarantee to the public

pure milk supply. It has been so regarded by the board in the ast, and the visiting physicians of the board in the tenement dis- icts have freely availed themselves of the milk tickets, of which I ave annually placed an unlimited quantity at their disposal.

My work is, therefore, in no sense different from that which the oard of Health exists to perform, and I can confidently claim for the utmost efficiency attainable by the employment of the most pproved scientific methods.

As to results, a remarkable decrease in the infant mortality of this ty for the last five Summers, and of Brooklyn, where it was par- ally applied last Summer, bear convincing evidence. The health uthorities of New York have borne emphatic testimony to the od results of my system of Pasteurized milk distribution among e poor, and the health authorities of Brooklyn have attributed it the lower rate of mortality which, for the first time in the story of the two cities, New York has recently shown as com- red with Brooklyn.

It has been only during the last two years that I have encoun- ed in the prosecution of my work any opposition from public icers of this city, to whom I thought I had every reason to look active aid and encouragement. That opposition has recently minated in a policy of deliberate annoyance, misrepresentation, l persecution which compels me to consider whether the de- nds even of a duty so imperative as I regard this one to be can satisfactorily met in the face of the apparent determination of n holding places of public responsibility to discredit my work l fatally impair its usefulness.

t should hardly be necessary for me to disclaim all desire for blic notoriety or business profit, direct or indirect, in the per- mance of the work which has been a very considerable drain h on my time and my purse. Those who know me are well are how utterly repugnant to me would be its association with sordid or interested motives. To the multitude whose sick bies have had the benefit of my Pasteurized milk foods I am but ame, and the vast majority of them know nothing of either my nmercial or personal relations.

Certainly neither have been obtruded on their notice, and in all necessary publicity given to my work there has never been a able uttered with my knowledge, consent or approval, relating he business houses with which I am connected. Until the sug- tion came from one of the public boards of this city, I had not

dreamed that the most perverted ingenuity of defamation could originate the idea that my devotion to the saving of infants' lives could be prompted by a desire to advertise myself or the firms to which I belong.

I believe you will sympathize with me in very keenly resenting such an imputation, which concerns the public aspect of my work in so far as it affords evidence of a fixed design on the part of some of your subordinate officers to do all in their power to misrepresent the character of that work and defeat its purpose. I cannot help regarding an attitude like this as a willful tampering with human life, as proof of a callous disregard of the sorrow and anguish which come to the poor no less than to the rich with the death of a child.

I can imagine no more awful responsibility than that of men who allow personal or political animosity to assume such a form as to make them regardless of the preventable sacrifice of the lives of thousands of these little ones. Permit me to add that I know of no way in which the work of the Board of Health can be so effectively supplemented and carried to its logical conclusion as by undertaking under its own supervision the preparation and distribution of Pasteurized milk food for the use of the children of the poor.

As I have already publicly stated, I am willing to equip at my own expense and convey to the city without charge a laboratory with all its appliances and adjuncts sufficient for such an expansion of my work as the needs of the population of New York demand. There must soon come a time when the yearly increase of the consumption of Pasteurized milk by the children of the poor will outrun the ability of any private individual to supply it at the nominal price to which I have adhered.

I had hoped to continue the work till the imperative necessity came for inviting some public association or the city itself to take it off my hands, but if the treatment which I have recently met be a sample of what I have to expect from those responsible for the conduct of public affairs in this city, I shall, no less in justice to my own reputation than to the efficacy of the work in which I have engaged, be compelled to abandon it entirely and leave the responsibility for its failure where it belongs.

It is for you, sir, to determine what shall be the future of an effort in public well-doing with whose scope and purpose you are entirely familiar, and about whose value to the people of New York you are as competent to judge as is yours, respectfully,

NATHAN STRAUS.

THE SANITARY DISPOSAL OF GARBAGE.*

Mr. Walter S. Pierce, of New York, opened the subject with a stated paper as follows:

Among the many evidences of the advancement in civilization in the present age is the wonderful skill exercised successfully in preventing the spread of contagious diseases. It seems evident now that tuberculosis can be communicated by the dust formed of the dried expectorations of persons affected with that fatal disease, hence the notices in the cars and ferry-boats of New York city forbidding persons from expectorating on the floors of public conveyances under a penalty of a fine therefor. Investigations have proven that garbage may become a fruitful source of disease. By garbage is meant the animal and vegetable refuse taken from our tables.

Now the theme upon which I have been invited to address this honorable body to-day is the sanitary disposal of this material, which, though harmless when fresh, may become very offensive and dangerous to public health if not promptly disposed of in a sanitary way. It is a subject that is now receiving anxious consideration by the city authorities over our entire country.

For the past few years it has devolved upon me to give this matter a great deal of thought, and to spend much valuable time and no small sum of money to ascertain the best method for disposing of garbage in an absolutely sanitary way and with as much economy as possible.

To this end I have given the various methods for accomplishing this purpose most careful investigation, and shall endeavor briefly to give you the merits and demerits of each.

FEEDING GARBAGE TO STOCK.

The indiscriminate use of this material as food for live stock has never been continued at but few places for any length of time, for the reason that it has proved to be a fertile cause of disease among the animals, and finally a financial loss to those who have undertaken it. A party who had the contract for disposing of the dead animals of New York city thought he saw a fortune in taking the garbage from the hotels and restaurants and fattening hogs with it. All seemingly went well for a while; but soon disease developed in

*Abstract from Proceedings of the Massachusetts Association of Boards of Health, at Fall River, April quarterly meeting, 1897.

his herd, and his two thousand hogs died in a remarkably short time. He experimented for a while longer, but finally gave it up; and to-day he will tell you that, if you desire to kill off your cattle and hogs, a most effectual method is to feed them upon garbage as it is collected in cities. Now there is no doubt in my mind that, if the bread and vegetable matter could be selected out while the garbage is fresh, and fed to animals, they would thrive and keep healthy. The trouble is that garbage is not collected frequently enough to have it reach the animals before it has soured and putrefaction has begun.

BURYING GARBAGE.

The method of plowing in or burying garbage is a better system, but it must be done promptly and thoroughly; and even then, to keep the land from souring, it must be sown in millet or some heavy feeder to keep it sweet, and prevent it becoming offensive. The objection to this method is that it is too expensive, involving in most cities a long haul and a large investment to obtain land for the purpose, and the endless expense of burying it.

CREMATION.

This system, or method, has little to commend it, being expensive and seldom, if ever, free from offense. It has been thoroughly tested, and has few, if any, advocates at the present day. A committee of gentlemen was sent out at considerable expense by one of the mayors of New York city to investigate the various methods for disposing of garbage. They reported as follows upon crematories, or incinerators: "The claim that any one of them destroys all combustible matter was abundantly disproved, and an interesting fact revealed during one test made in the presence of your commission. The refuse was run into an incinerator, and for more than two hours subjected to a heat of not less than 2,500 degrees, the refuse being violently stirred for most of the time by means of a pneumatic poker. Crude petroleum and compressed air produced the flame, which was of intense fury. And yet, when the residue was examined, there were found, with other combustible matter, pieces of newspaper which were scarcely charred.

"The same may be said of the failure of these incinerators to destroy the noxious gases."

The committee who made this report had the services of a scientific expert in all their investigations, and cremation was condemned by them.

UTILIZATION OR REDUCTION.

There are several processes or methods for the utilization or reduction of garbage, that is, which extract the grease and make the solid residue into tankage, which is one of the best known bases for a most excellent fertilizer. Average city garbage contains—

	Per cent.
Water, about	70
Grease, about	4
Tankage, about	26

There is a good market for the grease and tankage. They are both useful and valuable. Now to obtain these products in a marketable condition, and to make the process sanitary and inoffensive, has been the aim of every person engaged in the business. These results are claimed by the advocates of those who use the naphtha process, also those who use steam for the extraction of the grease.

There is no doubt whatever but that garbage can be disposed of economically and in an absolutely sanitary and inoffensive manner by a naphtha process, if the business is managed with as much care and skill as any successful factory; and my candid opinion is that the naphtha process is far preferable to the steam process.

It is a well-known fact that there is no agent which so completely destroys the germs of disease and all animal and vegetable life as heated naphtha; and the fact is indisputable that garbage which has been subjected to this treatment is absolutely disinfected and rendered entirely inoffensive.

It is claimed that steam is effectively used for the same purpose, and this may or may not be true; but it would be difficult to find a scientific man who had given the matter careful consideration, who would not pronounce heated naphtha far more effective than steam. They will tell you that one method is positive in its results, while the other is doubtful.

However, both systems have their advocates. St. Louis, Cincinnati, Buffalo and New Orleans have adopted naphtha processes; and the plants in those cities have been in operation for several years.

Recently a plant has been started in Philadelphia, one in Bridgeport, Conn., and one on Barren Island, about twelve miles from the city of New York, in which the steam process is used.

The one in Bridgeport seemed to have been inoffensive, but was a failure financially for the reason that only a small portion of the

grease was obtained, and there was an unusual loss of the so matter in the operation.

Those at Philadelphia and Barren Island have not been in operation long enough to judge of their merits.

To dispose of garbage in an absolutely sanitary and inoffensi manner requires the co-operation of the Board of Health and co tractor. The former should do all in their power to procure a sep ration of the rubbish and ashes from the garbage, and require t householders to keep their garbage pails or cans clean. Upon t other hand, the contractor should collect the garbage in neat, cle barrels, which have a metal cover fitting over the top of the bar snugly, and as soon as the barrel is filled the cover should be plac upon it, and kept on till it is dumped into the extractor at the worl

It is absolutely necessary that each household should have tv receptacles, one in which only the animal and vegetable matter placed, and in the other should be placed all the rubbish, such tin cans, berry boxes, pieces of crockery and glassware, bottl paper, rags, etc. If these precautions are taken, the contractor enabled to do his work better and cheaper. It is the mixing wi the garbage the rubbish referred to that makes the plant or wor expensive to construct and to run.

Collecting the garbage in barrels is unquestionably the be method that has so far been devised; and it is very doubtful as whether it can be improved upon, being far ahead of the open met carts now in use in New York and other large cities, which are fi quently seen in the streets with the tarpaulins, or covers, throv back and a pile of sour-smelling and unsightly garbage exposed view.

The works or plant in which the garbage is to be disposed should be a fireproof building, so that no break in the work c occur; for, should a plant be destroyed by fire, the contractor mig find it a difficult, if not impossible, problem to dispose of the ga bage in a sanitary way till his plant could be rebuilt, and thus t health of a city be seriously endangered.

The plant should be provided with steam or vapor tight st tanks, or extractors, about ten feet high and six to seven feet diameter, with a large door at the top for charging and a simil one at the bottom for discharging; also suitable steel tanks for st ing the naphtha and holding the grease; also convenient driers f drying the tankage, and proper receptacles for the chemical trea ment of the waste water so as to render it harmless, or for evapora ing and condensing it.

Now, then, when a load of garbage arrives at the plant, the barrels should be hoisted over the extractors, the covers removed, and the contents at once emptied into the extractor. Each barrel should be immediately sprayed with a disinfectant and deodorizer, so as to be in a clean condition to be used again. As soon as the extractor has received its charge, or load, of five to six tons, the doors should be tightly closed and naphtha introduced. The whole mass should then be heated by a coil of steam pipes within the extractor, the heat should be continued for several hours, till the disinfection by the heated naphtha vapor has been thoroughly accomplished.

It will be found that during this operation the grease has been dissolved, and can be drawn into the grease tank, passing out as a solution of naphtha and grease. Then by heating the grease tank by means of a coil of steam pipes within it, the naphtha will be volatilized, and, passing through the condenser, is ready, in a liquid state, to be used again. In the mean time the grease has been refined and made pure by the naphtha, and is in the best possible condition to find a ready market.

The solid matter left in the extractor will be found to have some naphtha left in it, which must be distilled off in the same manner as from the grease. It is then ready to be dried and disposed of to fertilizer manufacturers as a most excellent base to make a complete fertilizer, or, what is much better, to be converted into a high-grade fertilizer in the garbage works by adding to it the requisite amount of phosphate and potash.

It is self-evident that this high-grade fertilizer can be supplied to the surrounding farming country at a much less price than if the tankage is shipped to a manufacturer at a distance, and by him taken into his works and made into a fertilizer, bagged, and shipped back to the place it came from.

The most modern method or process for using naphtha for the purpose referred to renders the business perfectly safe, so much so that the most conservative fire insurance companies will take a risk on such a plant as has been described at a smaller premium than on the ordinary soap-works. Naphtha is now used in the largest linseed-oil works in the world for the extraction of the oil from linseed. They use barrels of naphtha where gallons are used in garbage works.

In conclusion, allow me to say that we are on the eve of a period when a well-constructed modern garbage plant will be as much a

part of every city's outfit as its gas-works, electric-light plant, a water-works, and a revolution brought about in the fertilizing i dustry. The farmers of New England and our entire country w be supplied with a most excellent fertilizer at a price so low th the products of the farm will be doubled.

A standard fertilizer at a reasonably low price is the great ne of the New England farmer to-day; and his only hope for the su ply of it is in the establishment of these garbage plants in the citi The fertilizer manufacturer will tell you that he sees no prospect obtaining the material composing a fertilizer at a less price than l has been buying them for during the past two or three years. Co sequently, present prices for fertilizers are about as low as they c be sold.

It is not an exaggerated statement to say that the establishme of such garbage plants as have been described throughout the citi of our country will add at least $100,000,000 annually to the i come of the farmers; and every one realizes what that means in t way of general prosperity. So that, gentlemen, this waste materi which has heretofore been a nuisance and expense to every city, w be converted into a blessing to the country at large.

DISCUSSION.

MR. MORSE, of New York, said: About four years ago I had t honor of making a statement before this Association in the city Lynn. I was in favor of cremation myself; and the statements th made were to the effect that reduction at that time was in an expe mental stage, that it had great promise and great possibilities, a promised to revolutionize the whole system of garbage treatme in this country, and to add to the farmers' interests very greatly.

The statement made on behalf of cremation was that forty or fi furnaces in the country were burning up this waste. The proce of reduction at that time had only five different exponents—Bu falo, Providence, Philadelphia, St. Louis and Detroit. Since th time there have been put into use about fifteen different plants f reducing garbage in the following cities: St. Louis, Buffalo, Ci cinnati, New Orleans, Bridgeport, New York, Paterson, Bosto St. Paul, Denver, Milwaukee, and, I think, Providence. At pre ent there are five plants only which are operating successfully out that number—St. Louis Cincinnati, Buffalo, New Orleans, Bridg port.

The following cities have adopted reduction, and have given or abandoned the work under great difficulties—Paterson, Was

ington, Boston, St. Paul, Denver, Milwaukee, New Orleans, Bridgeport and Providence.

Now that is the record of the reduction process in this country for the last four or five years. In ten years' time, I suppose, I have been the means of burning up more waste in this country, through the furnaces that I have erected, than any other man. I do not believe in burning up this stuff. I believe we are burning valuable things which we ought to save, but I think to-day that the process of reduction has not proved itself valuable enough to be taken up by cities yet.

There are sixty-five or seventy cities which are using furnaces for cremation; and they get nothing but 5 per cent. of ashes, worth $5 to $10 a ton. In many cases the product of ashes would defray the expense. It is not always true. We cannot show that in every case, but the burning of garbage by furnaces has gone a great deal further than the art of reducing it and making it a product.

If any reduction works can be brought into use which will show a profit on its own work, independent of the bonus to be paid by the city, then the work is accomplished; but if, on the other hand, any process seeks to be adopted which must have a bonus from the city of from 15 to 50 cents a ton, then there is a loss.

The statement of Mr. Pierce is undoubtedly true, that there is great value in this thing, but the figures produced and shown by every company that has come before the public so far do not show that profit. It has not been proven. The figures reported by Colonel Waring in New York show nominally about $2.40 for every ton of waste; but, in figuring on the actual work and getting money out of it, he fails and breaks down.

Now, speaking from my own experience, as Mr. Pierce has spoken from his, I believe, as he does, that the ideal method for any city in this country to adopt will be this—to utilize the garbage as far as it can be done. But we must remember that the garbage is only 15 to 18 per cent. of the whole waste. What shall be done with the rest?

If you take the ordinary cart-collecting in this town, as I saw this morning, you will find the valuable part, the garbage part, is only 10 per cent. The rest is ashes, rubbish, refuse of all possible matters that will burn and matters that will not burn. That part of the whole cart which must be taken care of is, say, two-thirds of the whole. You can take the 15 or 20 per cent. and do something with it; but what can you do with the other?

In New York we have got to that point where we are taking from six hundred to eight hundred tons of garbage down to Barren Island; but Colonel Waring finds on his hands more than 35 or 40 per cent of other waste that he cannot handle, and he is building furnaces to burn it up.

Therefore, I say this: If any suitable process of reduction can be brought forward, be sure to adopt it by all means. Then add to that, means for disposing of the other combustible waste which will have to be burned, and take that combustible waste and turn it into power to reduce your garbage. That is the economical and only way, and the best way that it can be done.

Now the question of handling this matter is getting to be solved on every hand—the question of carting and transportation, and how it shall be collected and used. A great many men are working at it, and a great many advances have been made. There are many carts in use which are entirely sanitary—that is, in New York at least—and many offensive features have disappeared by employing men and means to do the work well. But the great question we must consider, and which every town must look at, is what it is to cost. A reduction plant costing from $15,000 to $25,000 requires a contract of ten years, and must be carried on all that time to show any profit. The city must pay at the beginning not less than 50 cents per ton. Bridgewater was bankrupted, Washington was in a similar case, where they paid more than 50 cents, and the example in Chicago, where they paid 50 cents, was the bankruptcy of the company, also in St. Louis, where they paid $1.80.

Now, on the other hand, if a ton of garbage can be reduced to ashes at 50 cents—and I think it can—and the ashes turned into money by selling at $8 per ton, the proceeds being applied for the use of coal and labor, this economy comes; the first cost of the plant is only five, six, seven, or eight thousand dollars.

If garbage can be reduced to a merchantable product, and the man who does it can sell the product at $2.40 a ton, and have the city pay him 50 cents for doing the work, he is making great money out of it. Why should not the city have the benefit of it? Is there an example anywhere where that has been done in any case, and successfully carried through?

Four years ago I stated before this Association in Lowell that a furnace was being built to destroy garbage in the city of Lowell. The furnace has been running now four years, and the cost has been: for the first year, $1.15 per ton; for the second year, $1.10;

for the third year, 90 cents; for the fourth year, 72 cents per ton. Last week's run showed a destruction of 83 tons at a cost of 71 cents, and to-day that city has in its hands a proposition from the builders of the furnace to reduce the cost to 40 or 50 cents. Now there is progress. The same furnace which four years ago cost $1.10 or $1.15 per ton will reduce garbage to ashes to-day at 50 cents. Last year showed a net cost on the whole year of 68 cents. Now, if the cost can be brought to 50 cents by experience, certainly it can be brought below that.

I agree entirely with the gentleman who has spoken that, if it can be done successfully, it is the way to do it—to reduce it; but I say that in all the experience and time spent in this business, and the money, which will run far into a million of dollars, there has not yet been a single example of a successful garbage-reducing plant that makes money for itself, and does it at a very small cost to the city as compared with cremation.

THE CHAIRMAN.—I notice that Mr. Morse says, "If it can be done successfully"; and I apprehend there are many here who would like to know just what the colonel means when he says, "If it can be done successfully," it ought to be done.

MR. MORSE.—I mean by "successfully" this: First of all, within city limits, it is not to cost anything for transportation. Second, there is to be a profit to the man who does the business. The city must be protected against offense, and pay very little indeed for the protection.

THE CHAIRMAN.—Success financially, you mean?

MR. MORSE.—Yes.

MR. COFFEY, of Worcester, said: From the second city of the Commonwealth, Mr. Chairman, with all due respect to the Mayor; and I may say, parenthetically, that that step which he says separates Fall River from Worcester is one which will have to be taken by some one with seven-league boots. As the Chairman knows, in 1893, at the order of the City Council of Worcester, I investigated this subject of garbage disposal, and saw in operation all the plants that were then in existence. I traveled as far south as Washington, west as far as Chicago, and north to Montreal, and saw all the plants in operation in the various cities of the country at the time within that radius.

I do not agree with Mr. Pierce in saying that the system of cremation is a failure. On the contrary, I am very firmly of the opinion that for smaller cities the system of cremation is the best.

In the first place, the product is of no value to the city, if it costs $1.50 to get a dollar's worth. The agents of these reduction systems claimed that there was 30 to 35 per cent. in the investment. That is what they would whisper in your ear; but they wanted $50,000 to establish the plant, and then the city to pay 50 to 75 cents per ton for reducing it. I confess I was not favorably impressed with it from a sanitary standpoint. The reduction system is too complicated. There is too much machinery to it. I saw a plant in operation in Washington, costing one hundred thousand or more dollars; and it was not a sanitary success, in my opinion. It was subsequently burned down, and the city refused to allow it to be rebuilt. Washington is now, I understand, putting in a system of cremation. I do know furnaces can burn this garbage without serious offense. I do not take into account the value of the ash. That is a claim made by the agents of this system; but, in my opinion, it cannot be taken into serious consideration.

The question that presents itself to the average municipality is that this system of cremation is simple. The cost at the outside to erect a plant is not more than $10,000 or $12,000; and such a plant would be large enough to burn the garbage of a city of 100,000 people, and it can be owned, operated, and managed by the city afterward, while the reduction process is always a stock company, and there is always the suspicion of stock jobbing about it.

Now, as I have said before, it is of no account to the city, if there is a value in this garbage, if it costs more to get it out than you obtain for it when it is gotten out.

We had an offer at that time, from a concern whose furnaces I saw in operation and which are still in operation, to erect a furnace for the city of Worcester. The cost was to be $10,000, and a guarantee that the cost per ton would not exceed 45 cents. That was four years ago. Since then I have not given any particular attention to the subject; but I am informed, in a general way, that improvements have been made in the furnace, so that the cost to-day is somewhat less per ton than it was at that time. Now I do not agree with Mr. Pierce, either, that the feeding of garbage to swine is a failure. If it was so, we should probably be able to get rid of the hog power that we have in the city of Worcester. It has been in successful operation in Worcester for years, and is a financial success, leaving out the sanitary aspect of the case entirely. They have not had any epidemic among their hogs. The hogs have

thriven and multiplied, and there are about 2,000 to-day eating up the garbage of Worcester.

This is my experience. As I have said repeatedly, I believe furnaces for the smaller cities are best, because you can own them outright, control them outright, and the initial cost is not large.

MR. BRIMBLECOM.---I do not know that I can add anything to what has been said, as Mr. Coffey voices my sentiments in the matter. I would only like to refer the Association to the reports made for the last two years to the American Public Health Association by Rudolph Hering, of New York City, in which, on both occasions, he states that the cremation process is the only one he considers worth bringing before the Association. He does not consider the reduction process as at all sanitary. It seems to me that that position is being strengthened right through—that the reduction process is not a sanitary method, and ought not to be supported by persons engaged in sanitary work. I think those of us who visited the Buffalo works last September were thoroughly disgusted with the appearance of the works and the odor there was about the premises. I have read with interest the report of the New York State Board of Health upon that matter. A petition was brought to them by residents of the suburbs of Buffalo, and they held quite an extensive hearing. The testimony brought before them was very interesting; and the result was that they appointed an inspector, at the expense of the company, to see that the place was kept in a sanitary condition. That is sufficient comment on the Buffalo system of disposing of garbage.

In my opinion, the ideal solution of the garbage problem is to dispose of it upon the premises where it is made. It ought not to be taken away from the premises; but if, by any combination of circumstances, it is impossible to have it disposed of upon the premises, then the city should burn it in some way. There are various ways of doing this; and the experience across the water, and in one plant here on this side of the Atlantic, shows that it can be done in a sanitary way, and at a cost not exceeding 30 cents per on.

I trust that the matter can be practically brought to a head by having the members of this Association support a bill, which has been presented to several legislatures, prohibiting the feeding of garbage to swine. That bill, to my own knowledge, has been before the last two legislatures, and in 1896 I was the only person who appeared in favor; and I had to fight the whole city of Worcester,

which came down with mayor, aldermen and overseers of the poor. but I think the board of health was not represented.

At a hearing on the same bill at this legislature, as I had received such an overwhelming defeat in 1896, I kept quiet. I went there for information only, and found the whole city of Worcester there in opposition, as before. Mayor Quincy, of Boston, appeared to be in favor of the bill; but the committee again reported leave to withdraw. If this Association can, in some way, secure the passage of that bill, I think it would be the opening wedge to the sanitary disposition of our garbage.

DR. CHAPIN, of Providence, said: It seems to me that Mr. Morse has told us what the situation is. I agree with him that I should like to see a reduction process successful, and I agree with him entirely as to what success means. I have not yet seen any reduction plant that was successful. I hope that it will come; but, at present, I certainly cannot recommend it. We had the Simmonian system in Providence; and I know, as Mr. Pierce says, that a ton of garbage is worth $3, but it cost us $5 to get that out, and so the works were abandoned.

THE CHAIRMAN.—There are still left a few minutes in which this paper may be discussed briefly. Does any one wish to say a word more?

MR. PIERCE, in closing the discussion, said: I have a few words of reply to these gentlemen. I seem to be in a minority here today, and I must say that I am a little surprised for this reason. If the people of this country have a reputation for anything at all, it is for their enterprise and skill in manufacturing industries.

We have here an article which one of my friends says is not valuable, and has nothing of value in it; and another says that it is of value, that there is value in it; but that it is obtained at $5 when it is only worth $3 per ton. Now we all know that, if garbage contains $3 worth of products, the people of this country are not going to consider it an impossibility to get those products out economically. and in such a way as that they will pay.

Now, in reply to my friend, Mr. Morse, I would say that he emphasizes the fact that the city of St. Louis paid $1.80 per ton. I expect that the gentlemen who obtained that contract thought, as most gentlemen here would think, that they would get it at as high a price as they possibly could; and I think, by some hocus pocus among the politicians, they were enabled to obtain $1.80 in St. Louis. The company who furnished that process are wealthy peo-

ple; and they know the value of a dollar, and are not anxious to get contracts on which they will lose money. They succeeded in getting the highest price for treating garbage of any company. But the same company, when it came to bid for a contract in New York, offered to take the garbage for about 75 cents per ton. With all their experience in running an expensive plant at St. Louis, they did not make but $1.80; and they came to New York, and agreed to take a contract there at their offer of 75 cents. Another utilization process company did obtain that contract for about the same price, an equivalent of about 75 cents per ton.

Now, in answer to Mr. Coffey, of Worcester, I would say that I have great respect for his judgment. But here is the report of a committee sent out from New York city by one of its mayors. That committee or commission consisted of Thomas L. James, who is our postmaster; Charles G. Wilson, president of our Board of Health; Franklin Edson; Daniel Delehanty, lieutenant United States Navy; and W. S. Andrews, commissioner of street cleaning. These gentlemen were not interested in cremation or utilization processes. They visited, at great expense, all the cities of importance in this country. They examined all the processes; and, when they returned, they reported, as I told you, about crematories, condemning them in their recommendation, which, if you will bear with me a few minutes, I will read:

First—They recommend that dumping city refuse of any nature in the waters of the harbor or its adjacent or tributary waters should be absolutely prohibited.

By the way, they went on to show that it killed the oysters, absolutely, in water at all shallow.

Second—That the ordinance requiring householders to keep separate garbage or kitchen refuse from ashes and other house refuse should be rigidly enforced.

Third—That all house refuse should be collected in galvanized iron vessels with tight-fitted metal covers, and of such sort that when full, it can be easily handled by one man.

Now, gentlemen, these are business men, having no system to advocate; and this is their report. They are men well known,and had a scientific expert with them, a man of great ability, whom I know well; and they examined this subject carefully.

Fourth—That daily collections of garbage should be made by the city and delivered at the dumping wharves into the temporary storage, or to self-propelling boats of an approved type, furnished

by the party having a contract with the city for final disposition o the garbage.

As the plant for the reduction of the garbage of this city woul necessarily be extensive and costly, a contract for a sufficient lengt of time should be offered by the city to warrant the investment, sa not less than ten years, with proper provision for the transfer of th property by the contractor, at fair value, when the contract is termi nated. Ample provision should also be made, and abundant secu rity required for the performance of the work on the part of th contractor in a clean, inoffensive and sanitary manner, and remova of the garbage daily from the city to the reduction works, whic should be located at a suitable point beyond the city limits.

Sixth—That a separate collection should be made of the remain der of the refuse of the city not otherwise provided for, which shoul to be used for filling in at Riker's Island or elsewhere, and for th transportation of this material a sufficient number of self-propelle boats of an approved type should be constructed and owned by th city.

It should, however, be provided that, whenever the whole or an considerable portion of the street sweepings can be disposed of b contract, or sold for fertilizing purposes at a price greater than thei value to the city for filling, then such disposition should undoubt edly be made of them.

Seventh—That the city adopt metal, water-tight covered carts, o trucks, of a uniform pattern, for the collection of all refuse, and me chanical dust-collecting sweepers, when a satisfactory type can b obtained, and that, whenever the sweeping of the streets cause dust to arise, they shall first be sprinkled.

Eighth—That each refuse cart or truck depositing its content should be disinfected, and washed out thoroughly, before leavin the wharf.

Now the fifth I skipped, simply because I wanted it to come i last; and I want you, gentlemen, to consider the importance of thes recommendations.

So far as I am personally concerned, the garbage business i incidental entirely. I am not dependent upon it in any way, shap or form. I was led to investigate it from the fact that the busines I was engaged in—the importation of a very high grade of phos phate—was greatly improved by reduction processes, provided the were a success.

Fifth—That the garbage should be disposed of by a reductio

process producing fertilizer and commercial grease, and that the city should invite competition by the various companies controlling such systems, in order that the greatest benefit to the city may result.

I will briefly say that I do not care a cent about the garbage business, and I will tell you that I know, positively, that it will not be three years until every city of any size, that is not tied up by contract, will have the utilization process; and this valuable material will be returned to the farmers, where it belongs, at a price so low that there will be a revolution in the fertilizer business.

It is not often that I undertake to advise a body of men that is as intelligent as I know you are, in any matter; but what I have to say to you to-day is this: If you have any idea of contracting out your garbage or making any garbage products, go slow, and, as an old friend of mine used to say, "learn to pedal." The time is at hand when, if you have any system but a reduction system, you will be sorry for it.

ELECTRIC POWER AND LIGHT FROM CITY REFUSE.

THE SHOREDITCH ENTERPRISE.

In opening what is described as the "Shoreditch Municipal Electricity 'Manufacturer' and Dust Destructor," on June 28, Lord Kelvin inaugurated an experiment which will be watched with keen interest and attention by every large town in this country. About five years ago the vestry conceived the idea of combining the destruction of household refuse with the production of electric light. The practicability of the proposal having been favorably reported on by the experts consulted, the vestry proceeded to look for a site upon which to erect the necessary plant. A good deal of delay was caused by the difficulty of finding one at a moderate price. At length, however, one was obtained in Pitfield street, Hoxton, which, with additional purchases in Coronet street, was large enough to accommodate not only the dust destructors and electric lighting station, but also public baths and wash-houses and the free library. Discussion of details between the various bodies concerned caused

further delays, with the result that the electric lighting station is only now in working order.

There are twelve destructor cells, each having a grate area of 25 square feet, and heating six water-tube boilers working at a pressure of 200 pounds to the square inch. The chimney is 150 feet high and seven feet in internal diameter at the top, and, in addition, there are threee electrically-driven fans, which each delivers 8,000 cubic feet of air per minute, with a maximum ash-pit pressure of three inches of water. An interesting feature is the employment of Dr. Druitt Halpin's system of feed thermal storage. As it is necessary to keep the destructors burning continuously, steam is generated during all the twenty-four hours. But as power is required on a large scale during only a portion of that time, in order to reduce waste a plan of heat storage has been introduced by which during the day steam is mixed in a vessel with cold water in such proportions that at evening the cylinder is full of water at the temperature and pressure of the steam required by the engines. The boilers are fed with this heated water, and are said to be enabled in consequence to produce one-third more steam than they would if working with water direct from the mains. The electrical plant at present consists of three generators working at 1,100 volts, and three low-tension dynamos at 165 volts. All are driven by Willans' three-crank engines, coupled direct. The current supplied is continuous, the choice being determined by the large employment of electric motors that is anticipated in the district, and the distribution is on the continuous current motor transformer (Oxford) system.

At present the vestry pay 3s. 2d. per ton for the disposal of their refuse, and they calculate that burning it will save about 2s. per ton. In consequence they are prepared to supply electricity at 6d. per unit for the first two hours and 4d. an hour afterwards, while during the hours of daylight the price charged will be 2d. per unit. A contract has been concluded with a syndicate which will supply electricity at 6d. per unit at all hours by means of the penny-in-the-slot system, and will also supply fittings free of charge to the consumer; while another syndicate will supply free fittings to consumers who are ready to pay ¾d. per unit more than the vestry's actual charges. Orders have already been received to nearly the full capacity of the present plant. It is anticipated that if the scheme proves successful Shoreditch will consume about 20,000 tons of refuse in the course of a year.—The Surveyor, July 9, 1897.

VILLAGE SANITATION.

By Harvey B. Bashore, M.D., of West Fairview, Pa.

Village sanitation resolves itself into two chapters—first, the ıuse, and, second, its surroundings.

Village houses are always poor sanitary structures. The cellars d foundations are improperly constructed, and as a result ground- permeates the whole dwelling, especially in winter. A damp- oof course in the walls and a cellar floor of concrete and asphalt ıuld be considered a luxury rather than a necessity in the country. ıother point about cellars is the fact that they are frequently the eptacle for decomposing potatoes and other vegetables, a fact ich certainly does not add to the healthfulness of the house.

In the winter, the heating and ventilation are very poor, because ıost all village houses are stove-heated; and for a house to be ctually heated by stoves there must be a series of fresh air inlets l foul air outlets suitably arranged; and these do not exist in age dwellings.

Outside the house the first thing that strikes the sanitarian is the den, filled perhaps with decaying cabbage, kitchen refuse and like. It is needless to state that a lawn is the best thing to have ıut a dwelling; if there is a garden it must be cultivated thor- ghly, or it will be worse than none at all; decaying vegetables, in t all putrescible refuse, should be buried.

There should be no stagnant water about the place, but garden l lawn should be protected by ample surface drainage leading the nearest street gutter. The next point that would likely im the attention of our sanitary inspector would be the foul- elling privy vault, to which the inmates of the house must go, n or shine, subject to all sorts of exposure, both summer and ıter. An arbor covered with grape vines, Virginia creeper or a e of any kind should screen the privy from public view, and ke it more inviting than it is in most villages.

The privy structure may remain the same, but the vault or pit ıuld be filled with earth and a dry closet substituted, which is ily done in a crude way, by simply putting a coal bucket under seat. The contents of the bucket, which have been mixed h a little dry earth, should be emptied in the garden bed and cov- d with a thin layer of earth. It is really astonishing how quickly

a small quantity of earth—humus, I mean—will arrest odor. These little hills of closet earth may be raked over every two weeks, for in that time all fecal matter will have disappeared.

Near the privy vault—surely never very far away—is the well, and herein lies the greatest defect in rural sanitation; for from these wells, in the majority of cases, comes the typhoid fever so prevalent in small towns and villages. Deep tube wells are no better than any other kind, especially if the well is drilled in a bed of slate, sandstone or gravel; in a good many villages the deep wells show the greatest amount of pollution.

In one village known to the writer, the greatest number of typhoid cases, in fact all the cases which have occurred within recent years in the village, have occurred in the district watered by deep tube wells. One man who spent $185 to have a well drilled in his back yard is now ill with typhoid gotten from this very well.

To eliminate this rural plague we must eliminate either the wells or the privy pits. Experience in the country districts of Pennsylvania has taught me that there at least the elimination of wells and their substitution with cisterns is the most feasible plan and the one most likely to be adopted by the people.

That the substitution of cisterns for wells will do much toward eradicating typhoid fever in country districts has been proved by experience.

In the great limestone belts of Pennsylvania many of the villages use cistern water, and the record of one is the story of all. This town of 2,800 inhabitants is well known to the author; here for some twenty years the people have been using almost exclusively cistern water. What is the result? Typhoid is practically eliminated. In the last five years, for example, there have been two or three cases, but every one has been traced to well water; and not in one instance during the last twenty years has a case been traced to cistern water.

Here, then, is a town—one of many—where the typhoid sick rate is almost nil, and where the typhoid death rate is an item not considered. With the removal of the few remaining wells in this town we have a right to expect that there would be absolutely no cases of typhoid save imported ones.

Far different is the case with near-by towns where well water is used. One hamlet not more than seven or eight miles distant from this model village has some typhoid every year, and at present is just recovering from a severe epidemic.

Our sanitary inspector next examines the stables, pig-pens, etc. He finds that these conform to the general negligence exposed elsewhere. The refuse from these places is generally shoveled into a pile in the alley and perhaps surrounded by a few boards to keep the material from being scattered.

Such refuse should be kept in a cemented pit, open at the top and fully exposed to sunlight and air; if there is much odor, a little earth thrown over the mass will destroy it.

Pig-pens and cow-stables are not cleaned often enough, and cow-stables are always too dark.

So our sanitary inspector has gone through house and grounds, and he finds many defects. The alleys, or if there are none the streets, are littered with piles of stable refuse, interspersed with here and there a dead cat or dog. As he passes the village green a pool of stagnant water tells why malaria is so prevalent. At last he departs, and no longer does he wonder how it is that the village doctor is a man of means.

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FORMALDEHYDE AS A MILK PRESERVATIVE.

By J. N. Hurty, Ph. G., Indianapolis, Ind.

Harold Stacey, in his excellent article, entitled "The Preparation of Humanized Milk," in the June issue of the "American Druggist," advises strongly against the use of formaldehyde as a preservative for milk. "This agent," he says, "even in minute amounts, has a most injurious action on the mucous membranes, converting them, if the action is constant, into a substance closely resembling leather and setting up severe irritation. Given to infants in milk, its action on the coats of the stomach cannot be other than injurious, even in minutest amounts, and when used for this purpose may possibly prove to be the forerunner of life-long dyspepsia."

This conclusion is not, of course, drawn from experiment. The text plainly shows that the author feels warranted in this opinion from his knowledge of the fact that formaldehyde unites with flesh and skin to form something akin to leather. The inference seems fair that continued introduction of small amounts of the agent into the stomach will produce the "leather effect" upon its walls.

It is by no means absolutely certain that this will happen, for the stomach is an organ provided with most peculiar functions, and, possibly, for some reason, like that which prevents it from digest-

ing itself, it might refuse to be affected by small quantities of formaldehyde, even when administered for a long time.

The well-known ability of the animal organism to adapt itself through gradual stages to conditions originally adverse without affecting length of life or general health, is an important factor in this question. Experiment only will finally decide. For a child affected with marked indigestion, obviously due to fermentation, I recently recommended that cow's milk be treated immediately after being taken from the animal, with five drops of 40 per cent. solution of formaldehyde to each quart, and that the child be fed with the milk thus treated. Two weeks' trial of pasteurized milk did not bring relief. Within ten days after commencing the use of the formol-milk a decided improvement was apparent. Its continuation resulted in complete cessation of the symptoms. Now, after ten weeks' trial, with two intermissions, which admonished a return to formol-milk, the child is in excellent condition. Upon the principle that it is best to do without all substances of this character, when not actually needed, the formol has been discontinued, and the strength gained while using it has so far (six days) sufficed to contend against the influences which were before prominent. The most careful examination fails to discover that any stomach or bowel lesion exists. If a "lifelong dyspepsia" should very soon begin, it would not be entirely unfair to conclude that the formaldehyde was causative to a considerable degree, although acute indigestion undoubtedly existed prior to its exhibition.

FORMALDEHYDE IN ACID INDIGESTION.

Being cursed myself occasionally with attacks of acid indigestion, I have used formaldehyde as a preventive of the fermentation which causes the acidity, with most excellent results. Whenever the acid condition develops, I immediately abandon all foods except milk, and this I take, drinking it slowly, after adding to each eight ounces ten drops of 40 per cent. solution of formaldehyde. The results have been excellent, and although I have taken the agent in this way many times during the last year and a half, only the most desirable effects have been observed. For one week, as experiment, I took three times a day, after meals, four ounces of milk containing five drops of 40 per cent. formaldehyde solution. Not the least untoward result at the time or since has been noted.

This experiment, so far as it might go, was made to support or condemn an idea that milk might be preserved for consumption by formaldehyde instead of by pasteurization. The procedure

would be to collect the milk with extreme cleanliness and immediately add the minimum amount of the antiseptic which experience would dictate. Cooling and bottling would follow. Encouraged by the slight experimentation given, and not being deterred by fears that "beaker reactions" will unquestionably be the same in the animal organism, I am arranging to try formol-milk still further.

Lastly, attention is called to the likely injury resulting from the fermentation products which must exist in all milk before it reaches the city consumer, and from this the question arises, Could formaldelyde in minute amounts do more harm than these products?—American Druggist.

DISINFECTION BY VAPOR OF PHENOLS.

In a thesis for the M. D. of the Victoria University, Dr. J. Mountfort Johnson, of the Owens College, Manchester, narrates certain experiments he has made to ascertain the values of the vapors of the carbolic acid group as germicides. "No. 5 carbolic" is said by the makers to consist almost entirely of cresylic acid, there being but a small percentage of phenol present Dr. Johnson found that the vapor of 12 ounces acting for sixteen hours in a room of 1,500 cubic feet capacity did not kill staphylococcus, bacillus coli communis, anthrax spores, or the bacillus of cholera. There was only inhibitory action. The bacillus of typhoid was the only one killed. The vapor of izal he found too heavy for disinfecting purposes in this way. In the "strength of 8 ounces to 1,500 cubic feet there is not sufficient penetration to even inhibit growth." The vapor deposits on glass as a fine film. When 12 ounces of cresol (commercially pure) were evaporated in a room of 1,500 cubic feet the vapor was generally sufficient to destroy a six days' growth of the bacillus coli communis, the cholera bacillus, and a five days' agar culture of typhoid, but sporing anthrax on silk threads grew more abundantly than the control. Absolute phenol vapor had an advantage over izal or "No. 5" in its greater diffusibility and penetrating power. It even killed germs of such resistance as staphylococci and streptococci when wrapped in an envelope of filter paper. It killed other microbes exposed to the vapor, with four failures out of thirty-three pieces of inoculated

material employed. In three of the four the failure was evidentl due to an accident of position. Dr. Johnson considers "that th vapor of absolute phenol in a strength of 0.64 per cent is a reliabl germicide for the majority of these microbes when exposed to it action in an ordinary room for sixteen hours," but recommends working strength of 1 per cent., that is, the evaporation of 1 ounces for every 1,000 cubic feet. The thesis also deals with th experiments of other observers on these and other vapors, and de tails Professor Delépine's method of disinfecting walls by nascen chlorine obtained from bleaching powder. We are glad that th youngest of our Universities is encouraging original research o the part of its graduates. We learn from other sources that considerable amount of sanitary assistance is being given to th health officers by professors of the Colleges affiliated to this Un versity, not only in Manchester, where Professor Delépine has bee working along with Dr. Niven at the tuberculosis question, bu also in Liverpool, where the subject of tuberculous milk is obtain ing serious attention, and in Leeds, where for a couple of yeai Professor Trevelyan has been doing good work in the bacteri: diagnosis of diphtheria.—*British Medical Journal.*

PRESERVATION OF FRESH GRAPES AND SEED POTATOES I ITALY.—Consul-General Jones writes from Rome (Consular Re ports for August), June 24, 1897: "A recent bulletin of the Schoc of Agriculture of Scandicci, Italy, describes experiments made b Professor Marchi for the keeping of grapes fresh during the wir ter. A certain quantity of grapes (comprising different qualities was hung up in a cool and dry place, all damaged berries havin been previously removed; a second lot was packed in dry, pulver ized peat in wooden boxes. At the end of four months the grape that had been hung up had become decayed and had dropped off on the other hand, those that had been packed in the boxes wer found to be in fine condition. This is, therefore, a simple an economical method. Another one consisted in gathering th bunches with a good bit of stem attached and immersing their tip in bottles containing water and pulverized charcoal. Experiment were also made for preserving seed potatoes by using corn shucks sawdust, peat, and very dry sand. The three first-mentioned sub stances gave the best results, while the sand proved a failure."

TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF MINNESOTA.

By A. N. Bell.

Minnesota lies at the head of the Mississippi Valley, between 43° 30′ and 49° north latitude, and 89° 29′ and 97° 5′ west longitude. It is bounded on the north by British Columbia, east by Lake Superior and the State of Wisconsin, south by Iowa and west by the Dakotas. The extreme length of the State from north to south is about 380 miles; its breadth is from 262 to 337 miles; comprising an area of about 83,365 square miles.

The surface is undulating, and though devoid of any mountain ranges, or even high hills, it is the actual watershed of all that part of the North American Continent lying east of the Rocky Mountains. It is so made by virtue of its central situation—between the Atlantic and Pacific oceans, Hudson Bay and the Gulf of Mexico, and the artic and tropic circles. Accordingly we find a range of drift-hills crossing the upper portion of the State nearly from east to west, mostly with flat tops and nowhere exceeding one hundred feet of elevation above the adjacent country (though they are 1,680 feet above the sea), in or near which are the sources of the Mississippi River, the Red River of the North (which discharges its waters eventually into Hudson Bay), of the feeders and tributaries of the Lake of the Woods (which also connects with Lake Winnipeg, Hudson Bay and the immense system of watercourses of the northern part of the continent), and the sources also of the St. Louis River, the head and fountain of those waters which through the great lakes find their way to the Atlantic through the St. Lawrence River.

There are three distinct slopes, differing in soil, vegetation and geological character: The northern slope, including not only the Red River Valley, but the valleys and lakes of the streams draining into Rainy Lake and the Lake of the Woods; the eastern slope, occupying the valley of the St. Louis River and its tributaries, and declining towards Lake Superior, and the southern slope, drained by the Mississippi and its affluents, comprising about two-thirds of

the State, and extending into and forming part of the Mississippi Valley.

The descent from the summit of the divide to the southern boundary of the State is nearly 1,000 feet, but, except in the successive terraces at and near the Falls of St. Anthony, the slope is mostly gentle, rarely exceeding two and a half or three feet to the mile.

Three-fourths of the State may be generally described as rolling prairie, interspersed with frequent groves, oak-openings and belts of hard-wood timber, dotted with numberless small lakes, and drained by many clear and limpid streams. The other fourth includes the hills, which form the divide, the extensive mineral tract extending toward Lake Superior, and the heavy-timbered region about the sources of the Mississippi and the Red River of the North. The drainage of the State is mostly affected by the Mississippi, the Red River of the North, the St. Louis, and their tributaries. Of the affluents of the Mississippi, the Minnesota is the chief on the southwest side; others on the same side being the Root, Cannon, Sauk, Zumbrota, Willow and Crow Wing rivers; on the north and northeast the chief affluents are the St. Croix and Rum rivers, the latter the outlet of Mille Lacs Lake; branches of the Red River are the Wild Rice, Red Lake, Reed Grass and Buffalo rivers; of the St. Louis, are the Big White Face, Stone, Ushkabwahka, Floodwood and Savannah rivers. There are also many small streams flowing into Lake Superior, and several of large size, such as the Little Fork, Big Fork, Vermilion and Bandette, discharging into Rainy Lake River and the chain of lakes which form a part of the State's northern boundary.

Minnesota is especially remarkable for the number and great extent of the surface of her lakes, there being about 7,000 of them, and exclusive of those which form portions of the boundary, the lake surface is about 1-35th of the entire area of the State. A few of them, notably Mille Lacs, Leech, Red, Vermilion, Big Stone, Winnebegoshish, Traverse, Cass and Otter Tail, are of considerable size. The remainder are much smaller. Lake Itasca, the ultimate source of the Mississippi River, is of horse-shoe shape, and its greatest length is but twelve miles. Lake Traverse, the source of the Red River of the North, is long but narrow. Dead Fish Lake, source of the St. Louis, is small; Lakes Pepin and St. Croix are enlargements of the river beds of the Mississippi and St. Croix rivers.

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The vegetation differs considerably in relation with the differ-
ces in the soil of the three slopes above described. The northern
ope has a rich alluvial deposit adapted to wheat culture and gra-
g. This region has forests of oak, elm, beech and maple. The
stern slope is a better mineral than agricultural region; much of
as well as of the highlands or divides, is covered with a heavy
owth of pine, spruce and other coniferous trees, valuable as lum-
r, but the soil beneath, when cleared, is comparatively sterile.
ie southern slope, which comprises all the State below the high-
nds, is composed of alternate rolling prairie and woodland, and is
surpassed in fertility and productiveness. In this southern
ope particularly, there are groves and copses of great beauty on
e prairies and about the numerous rivers and lakes, while growths
dwarf oaks skirt the borders of the prairies and are known as
ak openings "

There is a remarkable tract, embracing both sides of the Minne-
ta River, over 100 miles in length, and with an average width ex-
eding 40 miles, comprising an area of 5,000 square miles, covered
th a dense growth of magnificent hardwood timber, and is known
the "Big Woods." In this, as well as in the smaller groves, are
und almost every species of deciduous tree known in the
orthern States.

Great losses have been sustained by the cutting of immense
antities of timber for manufacturing purposes. But during re-
nt years, much has been done by the State to repair these losses,
d tree planting is assidously encouraged by the State govern-
ent.

The indiginous flora of the State is of mixed character, of the
nadian or subalpine found along our northern boundary and the
alachian or Mississippian of the upper portion of the Great
lley.

Owing to the great number of small lakes, streams and marshes
the northeastern portion of the State, there is a great predomi-
nce of aquatic plants of the subalpine flora—wild rice, reeds,
llas and water loving plants generally; and, it is estimated, that
e amount of cranberry marsh, which yields abundantly, exceeds
0,000 acres.

THE CLIMATE of Minnesota, forty years ago, was as much or
ore vaunted as the most beneficial for consumptives as that of
lorado has been during more recent years. But proportionally
th the lapse of time, increase of population and carefully re-

corded observations, it has been supplanted in the public mind by the newer, but unverified, claims of superior advantages of the climate of higher altitudes.

Nevertheless, the climate of Minnesota is, on the whole, notable for its healthfulness, and with reference to consumption in particular, the ratio of deaths from that disease to the total mortality is remarkably low. The average mortality from consumption for seven years, 1887-1893, reported by Dr. C. N. Hewitt, Secretary of the State Board of Health, was 8.48. The total number of deaths from malarial diseases, for the same period, was but 41.

However, the winters are long and cold, though the atmosphere is relatively dry and the temperature comparatively equable. Mean winter temperature, deduced from records at different points of observation in the State, for a series of years, 16° 10; Spring, 46°; Summer, 75° 50; Autumn, 38°; annual mean, 44° 60. Annual rainfall, 29.25 inches.

The MINERAL SPRINGS of Minnesota are sparse, or, if they exist to any extent, they have attracted but little attention. Indeed, but one locality, that of Owatonna Mineral Springs, has been so improved as to render it a resort to some extent; and besides two, of nine springs, at this locality, five other springs only have published analyses.

The analyzed springs are as follows:

Owatonna Mineral Springs (2), near Owatonna, Steele County. Vichy Spring. Enno Sanden, analyst.

Alkaline.

Sodium carbonate	grains	per gallon.	52.41
Calcium bicarbonate	"	"	16.37
Magnesium bicarbonate	"	"	8.40
Iron bicarbonate	"	"	0.54
Sodium sulphate	"	"	0.45
Potassium sulphate	"	"	0.28
Sodium chloride	"	"	0.34
Alumina	"	"	0.10
Silica	"	"	1.79
Free carbonic acid	"	"	4.34
Manganese bicarb., sodium phos., sodium iodide, organic matter	"	"	Traces
Total			85.02

Calcareous.

:arbonate.....	grains	per gallon.	1.86
carbonate.....	"	"	13.20
ı bicarbonate.....	"	"	5.29
›onate.....	"	"	0.62
lphate.....	"	"	0.28
loride.....	"	"	0.17
.....	"	"	0.28
.....	"	"	1.12
ıtter.....	"	"	Trace
.....			22.82

Mineral Spring, near Minnesota City, Winona County. Noyes, analyst.

Calcareous.

ırbonate.....	grains	per gallon.	10.62
ı carbonate.....	"	"	6.08
carbonate.....	"	"	0.09
lphate.....	"	"	0.45
sulphate.....	"	"	0.04
loride.....	"	"	0.03
.....	"	"	0.14
.....	"	"	0.95
nitrate, phosphates.....	"	"	Traces
.....			18.40

›d Springs, Minneapolis, Hennepin County (3). Wil-›yes, analyst.

Calcareous.

rbonate.....	grains	per gallon.	9.79
ı carbonate.....	"	"	4.69
ılphate.....	"	"	0.12
lphate.....	"	"	0.49
sulphate.....	"	"	0.17
loride.....	"	"	0.07
.....	"	"	0.01
.....	"	"	1.22
ırbonate; calcium nitrate; phosphate.....	"	"	Traces
.....			16.56

Well, at Tracy Station, Lyon County. G. A. Mariner, analyst.

Calcareous.

Calcium carbonate	grains	per gallon.	41.25
Magnesium carbonate	"	"	14.70
Sodium sulphate	"	"	97.58
Iron protoxide	"	"	0.66
Silica	"	"	2.27
Sodium carbonate; sodium chloride	"	"	Traces
Total			156.46

Big Stone Lake, Big Stone County. James A. Dodge, analyst.

Calcareous.

Calcium carbonate	grains	per gallon	6.44
Magnesium carbonate	"	"	3.67
Iron carbonate	"	"	0.13
Sodium sulphate	"	"	5.58
Magnesium sulphate	"	"	8.64
Potassium sulphate	"	"	0.73
Sodium chloride	"	"	0.88
Silica	"	"	6.21
Total			32.28

Humboldt Salt Well, Kittson County. James A. Dodge. analyst.

Saline.

Magnesium carbonate	grains	per gallon.	78.60
Iron carbonate	"	"	1.08
Calcium sulphate	"	"	116.08
Magnesium sulphate	"	"	71.12
Magnesium chloride	"	"	91.44
Sodium chloride	"	"	2,764.99
Calcium chloride	"	"	42.26
Potassium chloride	"	"	156.55
Alumina	"	"	2.38
Silica	"	"	12.15
Total			3,336.65

Unanalyzed, or at least not published, but characterized as:

Calcareous:

In Section 22, Osborne Township, in Pipe Stone County.

Carburetted:

Near Freeborn and Alden, Freeborn County.

ılybeate:

\t Schwartz Lime-Kiln, Ottawa Township, Le Seur County.
\t Southwestern End of Lake Benton, Lincoln County.
\t western end of Lake Benton, Lincoln County.
n Section 16, Holly Township, Murray County.
n Home Township, Brown County.
n Pope County.
n Section 14, Kiester Township, Faribault County.
n Section 5, Otisco Township, Waseco County.
n Section 9, Otisco Township, Waseco County.
n Section 22, Muryaska Township, Martin County.
n Section 30, Swede's Forest Township, Redwood County.

ılybeate and Sulphur:

n Murray County, three miles south of Walnut Grove.

lphur Springs:

n Section 20, Edna Township, Pipe Stone County.

characterized:

Geisinger Spring, Rochester, Olmstead County.
ndian Medical Spring, Elk River, Sherburne County.
Mankato Mineral Springs, near Mankato, Blue Earth County.
Saint Vincent's Salt Well, Saint Vincent, Kittson County.
Salt Lake, Mehurrie Township, Lacqui-Parle County.

MPROVED KIND OF BATH.—As a substitute for the steam-room the Turkish and Russian bath establishments, and to avoid the focating discomfort of these in order to induce an excessive per-ration, comes the proposition of an electric light bath. The n, as described (Grand Rapids, Mich, Democrat, July 11), con-ts of a cabinet lined within on all sides with large mirrors, elec-: incandescent lamps being arranged about the inner walls in eat number and in such manner that their combined light and at will be reflected by the mirrors in the centre of the cabinet. A ovable couch to support the body of the bather in a reclining sition is arranged in the middle of the cabinet, the couch being ovided with a glass top on which the bather rests, and a mirror amber beneath the top. Incandescent lights are placed in this amber, so that their heat and light are reflected up through the ass top of the couch to the body of the bather. It is claimed for is apparatus that induced perspiration is caused at a much lower mperature than by the above-named baths, being also superior the stimulation of protoplasmic activity and more powerful to omote the action of the skin.

MORTALITY FROM SUNSTROKE AND HEAT EXHAUSTION.

By Frederick L. Hoffman.

Sunstroke and heat exhaustion caused in 1896 the death of over 2,000 persons in the principal cities of this country. Had only one-tenth of this number of deaths been due to cholera, typhus, yellow fever or small-pox there would have been endless discussions and numberless attempts at restriction and future prevention of such an occurrence, but the mortality being due to a cause accepted by the people with almost Mohammedan fatalism, very little of practical value remains as the result of this experience, and the present year may possibly claim an equal or even larger number of sunstroke victims without the world being wiser or more intelligent and able to cope with an evil of the most far-reaching consequences.

Life insurance companies have paid dear for this popular ignorance and indifference, most of all the industrial insurance companies, since the larger number of sunstroke victims were of the working classes who met with instant death in the pursuit of their daily and necessary occupation.

It is the purpose of this paper to bring together some of the scattered and almost unknown statistics of sunstroke mortality in this country for the purpose of illustrating the numerical importance of this cause of death, as well as some of the more interesting phenomena associated with its more or less frequent occurrence. While the following table is wanting in completeness, it will show a fairly satisfactory record of the sunstroke mortality in five of our leading cities for periods from eleven to thirty-one years.

It is here shown that the mortality from sunstroke and heat exhaustion is irregularly distributed over the various years, with a tendency towards a more exessive mortality in recent years. Before we inquire as to whether the mortality from this cause is relatively in proportion to the population more frequent in some cities than in others, it will be of interest to ascertain whether the mortality has actually, as well as relatively, been on the increase during recent years. This fact is brought out with exceptional emphasis for the city of New York in the table below, which will show the mortality from sunstroke and heat exhaustion per 100,000 of population at four different periods since 1851.

MORTALITY FROM SUNSTROKE IN AMERICAN CITIES.

	New York 1866–96	Cincinnati 1867–96	Philadelphia 1881–96	New Orleans 1884–96	St. Louis 1886–96
....	310	..	..	..	..
.....	5	3	..	..	..
....	196	28	..	..	..
.....	26	32		..	..
.....	238	6	..	..	..
.....	21	4	..	..	..
....	320	35	..	..	..
.....	34	4	..	..	..
.....	19	12	..	..	.
.....	19	5	..	..	..
.. ..	206	28	..	..	..
.....	21	2	..	..	.
....	52	32	..	..	.
.....	41	7	..	..	..
.....	116	27	..	..	..
.....	134	288	43	..	..
....	103	2	26	..	..
.....	33	3	32	..	..
....	107	11	32	14	..
.....	146	7	96	1	..
. .. .	42	1	19	10	14
....	216	152	127	4	56
.....	96	34	37	14	47
.....	32	1	6	16	.
... .	62	52	8	3	..
.....	95	5	22	10	3
.. ..	320	41	141	6	9
....	43	13	11	19	1
....	115	8	44	32	1
. .....	85	12	68	13	7
....	765	31	218	9	148

ATIVE MORTALITY FROM SUNSTROKE IN NEW YORK CITY, 1851-1896.

	Deaths from Sunstroke	Rate per 100,000
....	575	6 43
....	971	9.20
....	1,075	8.03
....	1,485	13.16

l be seen that the death rate from sunstroke in New York increased from 6.43 during 1851-1863 to 13.16 per 100,000 890-1896, or, in other words, deaths from sunstroke and haustion are at present twice as frequent in New York ney were during the 50's and early 60's.

able below will show that there exists a considerable de- difference in the relative intensity of the mortality from this various parts of the country:

COMPARATIVE MORTALITY FROM SUNSTROKE IN SIX AMERICAN CITIES, 1887-1896.

	Deaths from Sunstroke 1887-1896	Rate per 100,000
New York	1,829	12 07
Cincinnati	349	11 76
Washington	171	7.43
Philadelphia	682	6.51
St. Louis	272	6.02
New Orleans	126	5 21

The death rate of New York city, according to this table, was 12.07 per 100,000 during the decade 1887-1896, against a rate of only 5.21 for New Orleans, of 6.02 for St. Louis. Since the average maximum temperature during the summer months in both of the latter cities is usually in excess of the average temperature of New York, it would appear on the outset that mere solar heat cannot be the direct cause of this excessive mortality from sunstroke and heat exhaustion in New York and other Northern cities. This fact is brought out more clearly in the table below, which will show the number of deaths from sunstroke and heat exhaustion during the month of August, 1896, in nine leading American cities, together with the average maximum temperature and the corresponding death rates per 100,000 of population.

DEATHS FROM SUNSTROKE IN AMERICAN CITIES, MONTH OF AUGUST, 1896.

	Maximum Temperature	No. of Deaths from Sunstroke	Rate, 100,000
New York	94	726	42.73
Brooklyn	94	319	33.20
St Louis	100	132	25 78
Philadelphia	97	218	19.53
Baltimore	98	98	19.72
Boston	95	66	13 24
Washington	98	36	13.07
Chicago	98	178	11.13
Cincinnati	96	10	3 12

According to the above comparison, the highest mortality from sunstroke was 42.7 per 100,000 for New York city, with an average maximum temperature of 94° F., against a rate of only 3.1 for Cincinnati, with an average maximum temperature of 96° F. This comparison shows that a high average temperature is not neces-

sarily associated with an exceptional mortality from sunstroke and heat exhaustion.

On this point the Medical History of the War contains the following remarks:

"The causes of sunstroke operated chiefly in the months of May, June, July and August. These months were credited with ninety-two per cent. of the whole number of cases · * * * but these results depended less upon the temperature of the month than upon other circumstances."

What these circumstances may be is more clearly set forth in an article on the mortality from sunstroke during the month of August, 1896, and published in The Monthly Review of the Weather Bureau. After a discussion of the relation of temperature to the mortality from sunstroke, Professor Trowbridge remarks as follows:

"It is therefore evident that some people can withstand a higher temperature than others; in other words, there is a personal equation to be taken into consideration. It will be seen that while a mean temperature of eighty-two per cent. was fatal or injurious to a large number of people in Boston, yet the same degree of heat is the customary August temperature which the inhabitants of New Orleans endure without sunstroke or any particular inconvenience. Evidently there must enter into the case another factor, namely, the accommodation of the individual to average physical environment, or the climatic equation, and it is apparent therefrom that the temperature likely to cause sunstroke varies with the climate of the locality; hence each particular locality has for its native or acclimated inhabitant a special local sunstroke temperature or range of temperature.

On the basis of this proposition Professor Trowbridge proposes the following as a provisional index to the so-called sunstroke temperature:

"Sunstroke becomes imminent during the summer months when the mean temperature of any one day, or of several consecutive days, becomes equal, or nearly equal, to the normal maximum temperature for the same period."

But aside from these general considerations in regard to the direct influence of temperature on the mortality from sunstroke there remain the more important influences of age, sex, race, nationality and personal habits. All of these points, however, can only be very briefly dealt with in the remaining part of this paper,

Considering, first, the question of age and sex, the followin for New York city, for the five-year period, 1888-1892, wil how the two sexes at various ages differ in their liability t stroke and heat exhaustion:

COMPARATIVE MORTALITY OF MALES AND FEMALES FROM STROKE AND HEAT EXHAUSTION, NEW YORK CITY, 1888-18

Age Periods	Males	Fe
Under 15	5.48	
15–24	4.08	
25–44	18 96	
45 and over	24.76	1(
All ages	12 59	

This table shows that males at all ages, except fifteen to t four, exceed females in their liability to death from sunstro is shown that the mortality is highest at ages forty-five an(while the difference in the mortality of the sexes is greatest age period, twenty-five to forty-four. The average morta males at all ages is about three times as great as that of fe Next to age and sex, race and nationality are important f Negroes are less liable to sunstroke than the white populatic not exempt, as it has been stated by some writers. The fat more than twice as great among negroes than among white is, while they are less liable to be attacked, they are more li die when once afflicted. The following table will show the r of nationality to frequency and fatality of sunstroke in the l American cities during the month of August, 1896:

COMPARATIVE SUNSTROKE FATALITY RATES OF VARIOUS NA ALITIES.

Nationalities	Cases	Deaths	Mo Per
United States	340	37	1
Ireland	253	44	1
Germany	123	24	1
England	32	5	1
Italy	14	0	.
France	10	5	5
Noway Sweden	10	5	5
Canada	8	3	3

It remains for me to deal briefly with the influence of habi pecially to the use of alcoholic drinks, in their relation to freq

*Rates per 100,000 of population.

of sunstroke. The following table will show the habits of sunstroke victims, as well as the relative mortality per 100 cases:

COMPARATIVE MORTALITY OF ABSTAINERS AND NON-ABSTAINERS FROM SUNSTROKE.

Habits	No. Cases	No. Deaths	Per Cent.
Using to excess	140	41	29.29
Using moderately	230	22	9.57
Total abstainers	95	7	7.37
Total	465	70	15.05

It is sufficiently clear from a study of this table that drinking habits have a material and fatal influence in the causation of sunstroke. How far occupation had anything to do with this excessive mortality cannot be shown from the data at my command. It has, however, been stated that the greater number of cases occurred among those engaged in occupations apparently requiring physical rather than intellectual efforts.

How far life insurance companies have been affected by the excessive mortality from sunstroke and heat exhaustion during 1896 cannot be stated at the present time. The past experience of various companies would indicate that sunstroke causes from three to five per cent. of the total mortality from casualties. The following table for three companies will show the per cent. of deaths from sunstroke to the mortality from casualties in general:

DEATHS FROM SUNSTROKE IN THE EXPERIENCE OF THREE LIFE INSURANCE COMPANIES.

	All Casualties	Deaths from Sunstroke	Per Cent.
Mutual Life Insurance Company, 43-74	359	12	3 34
Mutual Life Insurance Company, 84-93	759	25	3 29
Washington Life Insurance Co., 60-85	126	5	3.96
Australian Mutual Prov. Society, 44-88	697	34	4.88

The facts brought forward in this paper would seem to warrant a more intelligent interest in the cause and possible prevention of deaths from sunstroke and heat prostration, for if it is taken into consideration that while the per cent. of fatal cases in the experience of the United States army (1869-1893) was only 3.76 against a ratio of fatal cases in the city hospital experience of 1896 of 16.65 per cent., it is apparent that there is considerable waste of human life,

the saving of which would undoubtedly materially benefit ordinar and especially industrial, life insurance companies.—From *Th Spectator*, Aug. 5, 1897.

THE HYGIENIC BENEFITS OF ELECTRICITY.—The times are no ripe in New York for the statement that the use of electricity ha obliterated disease, encouraged health, and among the poor th practice of visiting health resorts, because of the fact that this grea city carries its passengers by means of an immense cable system There are other great cities which differ in this respect from ou own, one of which, London, has many electric systems branchin out to various suburban localities. Our next door neighbor, Brook lyn, is an example of the extent to which electric roads can be de veloped so that those that desire can for a nominal fee be carrie from their homes to the cool, refreshing breath of the sea. If w were to discuss the influence and direct effect of the application electricity in various ways upon the millions clustered together i large cities, we would be surprised to realize that the rate of mo tality has actually been lessened and that as a mere accessory t modern civilization its benefits are immeasurably greater tha have ever been conceived. In the slums of large cities no brightly lit by the electric light crime has been practically erad cated. In these same centers, that are like a blot upon a city's fa face, disease is suppressed by the fact that five or ten cents carri its little ones miles away to the free, pure air of the country. W might rise to the middle classes, whose homes are far away from th scene of their daily labors, and realize what a boon it is to thos who earn a fair livelihood to invest it away from the crowded hea of the city. Suburban homes have been the means of adding a tr mendous amount of happiness to the toiling masses of large citie and they owe their homes and the cheapness with which they g to them to the trolley car. We, at present, hear the cry for rapi transit; but think how much better off we are than our grand fathers, whose only vehicles of propulsion were two muscular leg or even our fathers, whose means of getting to distant points of th city was that of the slowly moving horse-car. We can well believ that as an aid to health, growth and actual prosperity, our citie have no better friend to thank than the trolley car; no kinder ager to be grateful to than electricity.—New York Electrical Age.

TREATMENT OF THE INSANE IN FRANCE.*

By John Preston Beecher, Vice Consul, Bordeaux.

France is, without doubt, the nation which for a century or more has been in advance of all others as regards the treatment and care given to the insane. While the asylums of the United States, England, and most, if not all, other European countries leave much to be desired, those of France are model ones and worthy of the most attentive study and inspection. Nor is it astonishing that such should be the case, for nowhere has the study of mental aberration been pursued with such a degree of application as here. No country can boast of so many magnificent edifices given over to those unfortunate victims of fate who have lost their reason; no country can claim so many celebrated physicians who have devoted their lives to insanity and the insane.

Before the age of Hippocrates, who was practically the first to give attention to the origin and treatment of insanity, those afflicted with the malady were looked upon as beings who, having in some way merited the displeasure of the gods, were suffering the consequences of the latter's anger. The father of medicine, however, considered lunacy as a mental disorder, and, after the customs of the age, treated it as such. Sadly enough, his investigations and those of his disciples were forgotten, rather than improved upon, by the march of time, for, during the Middle Ages, the victims of phrenitis were tortured and burnt, as later were those who, through their strange behavior, were supposed to be possessed of the devil.

Melancholy appears to have been one of the principal phases of lunacy studied by Hippocrates, though he likewise noted the existence of puerperal insanity, hysteria, and epilepsy. Whether or not there existed asylums for the insane at, or somewhat after, the time in which the great Greek physician practised his art, remains a matter of conjecture. It is probable that idiots and harmless lunatics were permitted to go about as they pleased. Plutarch, nevertheless, makes mention of certain sanitariums, while Herodotus leads us to suppose that rigorous measures were taken with the insane. But Galan, Celsus and Asclepiades say nothing of the disease of which this report treats.

It was not until the end of the Sixteenth Century that the study of the ætiology and treatment of insanity actually received

*Abstract of Consular Report—Department of State.

any degree of attention. Those who made special investigations of the subject were Sennert, Plater, Bonet, and Vieussens. In the Seventeenth Century, Sydenham and Willis were particularly active in their researches; while from the commencement to the middle of the Eighteenth Century, Sauvages, Lorry, and Cullen did much to enlighten the medical profession on insanity and its mysteries.

But if the result of their inquiries as to the cause and origin of the disease proved more or less fruitful, their treatment of it was atrocious. Lunatics were dealt with worse than prisoners—bled, deprived of light, exercise, and sufficient air; they were frequently put in chains or thrown into dungeons; badly fed and poorly clothed. It is even said that in France the public were admitted to the asylums on Sundays and holidays, where they annoyed and laughed at the inmates. This deplorable condition of affairs continued until 1792, when Dr. Pinel, whose name will for centuries be identified with the progress of medical science, brought about a series of reforms which have existed and been improved upon ever since.

Pinel was born in 1755, studied medicine at Toulouse, and went to Paris when yet a young man. In 1792 he was appointed physician at the insane asylum at Bicetre, near Paris, where he found the inmates in the state above mentioned. Being not only a skillful physician, but a vigorous writer and speaker as well, he was not long in persuading those in charge of the institution to modify the system then in force. Violent coercion gave place to mild restraint, and iron fetters and heavy chains were thrown aside to rust from disuse. Pinel saw that his patients were first well provided for and afterward took the pains to accomplish what is invariably done to-day—the isolation or separation of one category of lunatics from another. The raving maniacs were relegated to a wing of the asylum specially set aside for them; those less excitable and dangerous to another. The sufferers from melancholia and those whose form of insanity was of a more cheerful nature were separated. Patients suffering from insanity of an epileptic and paralytic origin and having as little control over their members as over certain other functions (a class aptly characterized in France as "gateux"), lived and slept apart from the others. The noisy ones were prevented from coming in contact with the quiet, and so on.

The humane and rational treatment adopted by Pinel was seconded by that of Esquirol, who himself planned a number of asy-

lums. As a teacher he was unrivaled. Among other noted specialists of this period in France may be mentioned Trelat, who wrote of, and practically discovered, lucid insanity; Falret; Morel, who gave special attention to hereditary insanity; and Lasegne, who devoted his studies to the various phases of the delirium of persecution. Parchappe, Foxville, Marce and Leuret also deserve mention among this galaxy of alienists. To them and to their pupils France owes the high standard of its asylums for the insane and the care given to their inmates.

Of the various ills to which man is subject, none are more dreaded and few are so little understood as that which involves the loss of intellect. Nor can we wonder at our comparative ignorance of the nature of this malady when we consider what mystery hangs over the workings of the mind in its healthy state. But even while our knowledge of the nature of the mind and its operations remains so limited, much may be and is done toward alleviating the miseries which mental aberration induces, by investigating the causes which influence its prevalence. Some individuals appear to be so prone to insanity that very slight causes are sufficient to induce it in them. It is probable that there is always some peculiarity in the constitution predisposing to it, since the apparent 7causes do not differ from those which, acting on other persons, produce other diseases and not lunacy. Marce has given, as among the principal causes, civilization, religious ideas, diathesis, climate, profession, education, emotion, imprisonment, anaemia, cachexy, fevers, pregnancy, parturition, intoxicants, the effects of lead, mercury, opium, belladonna, etc.

The proportion in which the sexes are affected with insanity varies very much in different parts of the world, and statisticians rarely agree on the point. In Great Britain and Ireland, the proportion of male to female insane is stated to be as 13 to 12; in Italy, also, the number of male lunatics is greater than that of female; in France there are more women than men insane, in proportion of 14 to 11.

The Republic of France is divided into eighty-six departments. These geographical divisions are presided over by prefects, and are, to a certain extent, similar to American States. While the prefect enjoys the functions of a governor, he is responsible to, and receives his instructions from, the Minister of the Interior. The majority of the departments have asylums for the insane, though others have not; some, again, have two. In departments where

no asylum exists, lunatics are placed in the hospitals, though certain department establishments of this description receive lunatics from other departments.

The insane asylums of France are managed by a director, who is usually, though not necessarily, a doctor; by an attending and an assistant physician, both of whom live in the asylum. Vacancies in the medical staff are filled after competitive examination, and those who enter the service usually remain in it all their lives. They are well paid and have a handsome house within the grounds in which to reside. The establishments themselves are under the direct supervision of the Minister of the Interior, and for this reason the prefect or one of his subordinates is obliged by law to visit them frequently. The visitor must see that everything is properly conducted, offer suggestions to the Government for any radical changes, and make note of any well-grounded complaint presented to him by an inmate. A justice of the peace or a mayor is authorized to do the same thing, and the district attorney, or the official known in France as the "procureur de la republique," must visit the asylum of his district at least once every three months.

No private asylum for the insane is permitted to exist except by authorization of the Government, and where institutions of this description do exist, they are subject to the same rules, regulations and laws as are those under direct control of the State.

No person is admitted to an insane asylum in France at the request of family or friends without—

(1) A written demand made by a relative or acquaintance, as follows:

The Director of the Asylum of ———.

SIR: We, the undersigned (here give the names, ages, residences, etc.), have the honor to advise you of the fact that Mr. (or Mrs.) ———, our ——— (sister, brother, or cousin, as the case may be), is insane, as proven by the annexed medical certificate signed by Dr. ———, and desiring to have Mr. (or Mrs.) ——— receive proper treatment, we beg of you to admit him (or her) to your asylum.

[Signatures.]

(2) A certificate signed by a physician attesting that the person whose confinement is demanded is actually insane. This certificate must be given within a period of fifteen days previous to that on which the patient is admitted, and the physician signing it must not be a relative of the afflicted person. It must give a specific description of the nature of the malady, whether it be mel-

, religious mania, persecution, etc., and can only be dis-
with in cases where the insane person is so violent that his
admission into the asylum necessitates the doing
th formalities. Within twenty-four hours of the time
e lunatic is admitted, one of the physicians of the asylum
id this certificate, together with one of his own, to the pre-
ie department in which the establishment is situated.
n days subsequent to a patient's admission, a physician
i the asylum must send another certificate to the prefect.
he must state plainly the exact condition of the person
eatment, the results of his own personal observation, etc.
French asylums, we find wards set aside for those persons
e just been admitted, where they may be better observed
y could possibly be were they placed at once among the
mates.
on as a sufferer from insanity is admitted to an asylum he
s minutely interrogated by the resident physician. Rela-
d friends are also questioned and the inmate is registered
ws:

INSANE ASYLUM OF——

ient
Name, ———
Place of birth, ———
Age, ———
Profession, ———
Date of enry,———
is———
Date of discharge, ———
Date of death, ———

Résumé of the patient's life.

Diseases existing in the family.

er's side———
her's side———

Physiological antecedents.

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Morbid antecedents.

Diathesis:
Nervous diseases:
Fevers:
Inflammatory diseases:
Surgical operations:
Miscarriages:
Parturition:
Puerperal maladies:

Presumed causes.

Physical:
Moral:

Prodromes.

Condition of the patient when admitted.

General observations.

An inmate of an asylum may be discharged, or his liberty restored, by the same process through which he or she was admitted. If, however, the physician in charge considers the lunatic dangerous, the case may be submitted to the prefect, who decides whether or not public safety demands the patient's retention. The prefect is also allowed by law to order the confinement of any person whom the police assure him to be dangerous.

The chief advantage the insane asylums of France have over those of the United States is (1) that they are, for the most part, built in the country, at a short distance—let us say 2 miles—from large cities; (2) in place of being four, five, or six stories in height, they never have more than three, and usually two, stories, and some consist only of ground floors, in order that they may be spread over as much space as possible; (3) every ward has a promenade or quadrangle of its own, shaded by trees, in which patients can enjoy an abundance of fresh air.

While the greater number of inmates in asylums for the insane are cared for at the expense of the department, all institutions of this description have especial accommodation for patients whose families can afford and desire to pay. There are usually four classes. The first offers accommodation, food, medical and other attention, etc., at $1.40 per day, the second at 90 cents, the third at 70 cents, and the fourth at 50 cents per day.

In the department of La Gironde, in which the city of Bordeaux situated, there are two asylums for the insane, one for women, e other for men. The asylum for men is situated at Cadillac, a ace about 20 miles from Bordeaux, while that for women is about ve minute's walk from the city limits. The latter, known as the sile de Chateau Picon, is one of the finest in France, so that in iving a description of it I shall describe not only a model estab- shment, but the workings, management, and system of others milar to it.

The institution is surrounded by about 20 acres of ground, in elf a veritable park. Entering a large gateway and crossing a ll-kept lawn, we find ouselves at the administration building, ich is given over entirely to offices, reception rooms, apartments the filing of documents, the pharmacy, etc. At the right side the gate as we enter are separate buildings in which reside the di- ctor, resident physician, and chief accountant. To the left are a mber of villas occupied by lunatics whose families pay at the rate $1,200 a year for their care. Behind the administration building the asylum proper. A comprehensive idea of the whole is ob- ined from the plan herewith. The plan does not comprise the ildings where the pay patients are treated, but is sufficient to ow the general principle on which French asylums are built.

Each ward is under the direction of a sister of charity, assisted six or eight female nurses. In asylums given over exclusively the treatment of male lunatics, the attendants are, of course, men, ough the cooking, washing, etc., is done by sisters.

It will be observed that at the asylum of Chateau Picon the tchen is situated in the middle of a long corridor, from which cess is obtained to all the wards. This makes the distribution of ch repast very simple. The following bill of fare, taken at ran- m from a number of others, shows the dishes served to the sev- al clases of inmates:

First class.—Breakfast: Coffee, chocolate, milk, and bread and tter. Lunch: Soup, boeuf à la mode, roast veal, tomatoes, and uit. Dinner: Soup, roast beef, chicken, mashed potatoes, and uit and pastry.

Second class.—Breakfast: Coffee, chocolate, milk, and bread d butter. Lunch: Soup, fish, beefsteak, and fruit. Din- r: Soup, roast veal, mutton stew, and fruit.

Third class.—Breakfast: Coffee, chocolate, milk, and bread d butter. Lunch: Soup, beef stew, and tomatoes. Dinner: up, chops, and mashed potatoes.

Fourth class.—Breakfast: Soup. Lunch: Soup and beef. Dinner: Soup and vegetables.

The food is carefully cut in the kitchen before it is served, and every patient has a glass of claret with each repast.

The director of the asylum of Chateau Picon is Dr. J. G. Gales and the resident physician is Dr. J. Pons. To Dr. Pons, I am indebted for all the facts, information, and statistics embraced in this report, and avail myself of this occasion to express to him my thanks not only for his valued aid, but for the exceptional interest taken in the work. This gentleman has been for many years attending physician first at the insane asylum of Marseilles, afterwards at Pau, and for the past eight years at Bordeaux. He is a recognized authority on mental aberration and the care and treatment of the insane, and for this reason, I was particularly fortunate in being able to visit, in his company, the institution to which he is attached.

The doctor rises early, and at half past 7 is in his office. On his desk, he finds a report which gives at a glance a résumé of what has occurred during the preceding day and night.

At 8.30 a. m., the resident physician starts on his regular morning round of the wards, examining each patient in turn, prescribing shower baths for those in a state of depression and opiates or bromides for those suffering from acute mania or excitation. Dr. Pons, both through the attention he gives his patients and his kind treatment of them is very much liked by the inmates. At the asylum, there are several English, Spanish, and Italian subjects, and with these the physician converses as fluently as with those of his own nationality. He visits first the cells. These are apartments about 8 feet square and 10 feet in height, with a window near the ceiling. The doors are of wood 2½ inches in thickness and provided with a small aperture through which the inmates may be seen from without. Each cell is provided with a water-closet, and lighted at night by means of electricity. Those patients who have no suicidal intentions are provided with a comfortable bed, though others are, of necessity, forced to sleep on straw. Patients who might use their bedclothes or garments to strangle themselves are dressed in a suit forming coat and trousers, buttoned up the back. While allowing perfect freedom of movement to the lunatic, it can be neither taken off nor torn.

From the cells, the doctor visits the other wards and quadrangles, nspecting in turn the epileptics, the noisy, the quiet, etc. This our comes to an end at noon.

The building for the patients who pay at the asylum of Chateau Picon is magnif.cent. The private dwelling of a wealthy resident of New York or Washington could not be more richly or handomely furnished. Patients paying at the rate of $1.40 per day ıave a suite of apartments consisting of a parlor, dining room, bedoom, etc., while those paying less than this have a bedroom quite s handsomely furnished as the suites.

The duration of insanity has no limits. The attack may last a ew weeks or it may continue for years; it is not uncommon to meet n asylums with persons who have been insane twenty or thirty ears. When the disordered state of the mind is protracted, it ısually terminates in total loss of the intellectual faculties. The tate of imbecility or dementia which then succeeds has many degrees. It commences by the loss of memory, particularly for more ecent events. The mind receives impressions and perceives them, ut the faculty of retaining them seems to be lost. Frequently, vords which were spoken but a few minutes previously are forgoten, though the memory for events long gone by is quite distinct. In a second degree of imbecility, the power of directing the houghts is lost; ideas come and go without order and independntly of the will; questions are still heard and attempts made to eply to them, but before the answer is half completed, the train of hought is lost and the mind and tongue reduced to a state of inanity. The features are void of expression, the countenance vacant, the eye wandering. At last, even the instincts are lost, and he sufferers, careless of the calls and wants of nature, sit or lie notionless. The chances of recovery vary much according as the insanity is complicated or not with other diseases; it is also nfluenced by the form of the disease, the period of its course, the ge, sex, and condition of the patient. Of the diseases which frequently complicate insanity, epilepsy and paralysis are the most ften noted. If paralysis affects the motion of the limbs, the peech, or both, the case is generally considered hopeless. Complication with epilepsy is equally unfavorable. General intellectual lerangement is more curable than monomania. Imbecility is ısually incurable. The period at which mental aberration is rought under treatment has an important influence on the chance f recovery. Of those who enter asylums soon after the com-

mencement of the malady, five out of eight recover. After the third year of the disease's appearance, the proportion of cured is not more than one in thirty. The age most favorable for recovery from insanity is the period from the twentieth to the thirtieth year; few recover after the fiftieth. During the period of convalescence, there is great liability to relapse.

The treatment of insanity in France resolves itself into the medical and moral. The medical treatment indicated at the commencement of the disease consists chiefly in the attempt to reduce increased nervous or cerebral excitement. In the more chronic conditions of the disease, the medical treatment is chiefly directed to the restoration and maintenance of a healthy state of all the functions of the body. A strengthening diet, cleanliness, fresh air, and exercise are all necessary. The asylums of France afford all these requirements. Physical restraint, except in cases of absolute necessity is avoided, and one never hears in this country of the outrages perpetrated by guardians such as frequently come to light elsewhere.

The attending physicians of French asylums know all their patients by name, the exact nature of their insanity, and the measures which usually appear to calm them. The slightest change in a sufferer is noted, and he or she is transferred from one ward to another as occasion requires. As far as food, attendance, and interior luxury go, many of the inmates are better off than in their own homes, and it is for this reason that the insane asylums of the Republic of France serve as models for the whole world.

FEIGNED INSANITY AND HOW IT WORKED.—A barrister of the City Court of Louisville is very much chagrined on account of a trick played on him by one of his clients, thereby causing him to lose a fee of $25. Several days ago a man was arrested on the charge of "shooting at without wounding." This picturesque figure of the City Court, who brags that the rich coloring on his nose has cost him a small-sized fortune, was consulted and consented to defend the man.

Before the trial came up the barrister called his client from the court-room and said: "Now, the only way you can get out of this scrape is to play insane. Whenever a question is put to you, instead of giving an intelligent answer, just wave your hand in front of your face and whistle. The Judge will at once adjudge you insane, and, of course, you will be all right."

The man consented to play insane, and took his seat on the stand.

"What is your name?" asked one of the attorneys.

The defendant looked idiotic, waved his hand, and then whistled.

Everybody in the court-room began to laugh. Question after question was asked the man, but he answered all of them by waving his hand and whistling immediately afterward.

"I adjudge you insane," said the Judge.

"Ah, what did I tell you?" said the barrister, walking over to his client and congratulating him. "That was a magnificent play. I will charge you $25 for defending you and would like to have my money now."

The alleged insane man looked worried and scratched his head. He never said a word, but waved his hand through the air, gave a short, shrill whistle, and bade the attorney a fond adieu.—Louisville Courier-Journal.

HEREDITY RUN MAD—AN ILLUSTRATION.—"Dr. Kendrick, of Mississippi, recently related a case in which a colored girl, while pregnant, became very angry with an old colored woman who had paralysis (wrist drop) of the left hand, and who also limped badly from an injury to the left leg. The pregnant girl would imitate the walk of the old cripple for the amusement of others. In due time a female child was born possessing a deformed left hand and the left leg smaller than the right. It lived to be grown and died of phthisis. It had wrist drop and always walked exactly like the old woman whom the mother ridiculed. The mother was, is now and always has been, healthy, and has given birth to four other children, all of whom are healthy."—Medical and Surgical Reporter, July 31, 1897.

And this is cited by Dr. Wm. M. Ogle (in the article from which this extract is taken) in support of "Darwin's assumption that from all parts of the living body, living gemmules are being thrown off which are aggregated in the reproductive organs." Whose, or rather which, in this case—the old paralytic's gemmules (thrown off and aggregated in the reproductive organs of the pregnant girl), or the girl's, thrown off and transplanted at the sight of the paralytic?—ED. SANITARIAN.

HUMANITY AND EXPERIMENTS ON ANIMALS.

Lord Lister recently made an important and interesting address on the subject of modern pathologic research at the opening of the Belfast Physiological and Pathological Laboratories, an extract from which as published in the "British Medical Journal" being as follows:

"There are people who entertain exaggerated views," he says in effect, "regarding the work that is accomplished at such laboratories. There are people who do not object to eating a mutton-chop, people who do not even object to shooting a pheasant with the considerable chance that it may be only wounded and may have to die after lingering in pain, unable to obtain its proper nutriment, and yet who consider it something monstrous to introduce under the skin of a guinea pig a little inoculation of some microbe to ascertain its action. Those seem to me to be most inconsistent views. With regard to all matters in which we are concerned in this world, everything depends upon the motive. A murderer may cut a man's throat to kill him; any one of you medical students may have to cut a man's throat to save his life. The father who chastises his son for the sake of the good of his morals is a most humane man; a father who should beat his son for the mere sake of inflicting pain upon him would be an inhuman monster. And so it is with the necessary experiments upon the lower animals. If they were made, as some people seem to assume, for the mere sport of the thing, they would be indeed to be deprecated and decried; but if they are made with the wholly noble object of not only increasing human knowledge, but also diminishing human suffering, then I hold that such investigations are deserving of all praise. Those little know who lightly speak on these matters how much self-denial is required in the prosecution of such researches when they are conducted, as indeed they always are, so far as I am aware, with the object of establishing new truth. The exercise of a little charity might lead those who speak of us as inhuman to reflect that possibly we may be as humane as themselves.

"The profession to which I have the great honor to belong is, I firmly believe, on the average, the most humane of all professions. The medical student may be sometimes a rough diamond; but when he comes to have personal charge of patients, and to have

e life and health of a fellow creature depending on his individual re, he becomes a changed man, and from that day forth his life comes a constant exercise of beneficence. With that benefi-nce there is associated benevolence; and in that practical way ır profession becomes the most benevolent of all. If our de-actors knew this, common sense would enable them to see that ır profession would not be unanimously in favor of these re-arches if they were the iniquitous things which they are some-mes represented to be.

"I have been interested in the following account of a part of asteur's work on rabies: It had been established that the intro-uction of a portion of the brain of a mad dog under the skin of a ealthy animal was liable to cause rabies, and Pasteur had reason to elieve that it was principally in the nervous centers that the poi-on accumulated. He felt a very strong desire to introduce some f the poison into the brain of an animal; but he was a peculiarly umane man. He never could shoot an animal for sport. He as more humane than the great majority of human beings, and or a long time he could not bring himself to make the experiment f trephining an animal's skull and introducing some of the poison f rabies into the brain. He was exceeding desirous of doing it to stablish the pathology of the disease, but he shrank from it. On ne occasion, when he was absent from home, one of his assistants id the experiment, and when Pasteur came back he told him that e had done so. 'Oh!' said Pasteur, 'the poor creature! His ain has been touched. I am afraid he will be affected with par-ysis.' The assistant went into a neighboring room and brought the animal, which was a dog. It came in frisking about and in-stigating everything in a perfectly natural manner, and Pasteur as exceedingly pleased, and although he did not like dogs, yet he vished his affection upon that particular animal and petted it; id from that time forth he felt his scruples need no longer exist. o soon as our poor selves are directly concerned our objections nish into thin air; a tiger threatens to invade our camp; who ould care much about what kind of trap was set for it, or what ffering the trap caused the animal, so long as it was caught? hen the matter affects only the welfare of others, including that generations yet unborn, the good done does not appeal to the dividual and the objector sees only the alleged horrors of modern ientific investigation; of which horrors, however, he quickly ses the sense as soon as he becomes personally concerned."

THE MINE.

By Grace Duffie Boylan.

D'ye know what it means to work under there,
Away from the sunshine and outer air—
The only free gifts even God can give
To help a man in his struggle to live?
Where the laugh of a child, the song of a bird,
The voice of a woman are never heard;
Where the only sound is the click, clang, click
Of your badge of power, the miner's pick.

The thought of the damp grows a haunting dread—
Not for ourselves—we were better dead;
But for children, for wives, who bide above
With little to live on but faithful love.
Smiling through hunger and cold, woman-wise,
And raising new hope when an old hope dies;
And nerving our arms for a coming day,
When for honest work there'll be honest pay.

We burrow and store, like the senseless mole,
Roofed and inclosed by the glittering coal,
That changes to gold at touch of your hand—
Gold for fresh pleasures, new treasures, more land,
But leaves us blackhanded, and famished, and sick,
With naught in our hands but the shovel and pick—
Strong keys, which will some day, it may be, unlock
The door that ne'er yielded to timid knock

We look from the dark and we cannot see
In the glare of the world how this can be,
That you, who're but men such as we, can hold
The balance of pow'r, the will, and the gold,
While we, e'en as if we'd gone to the wall,
And borne on our ears the brand of your awl,
Must slave in your mines and sullenly turn
To beg for the wage we honestly earn.

—From *Chicago Journal.*

THE MEDICINAL EMPLOYMENT OF COFFEE.

'ONATHAN HUTCHINSON in his *Archives of Surgery* says: "I ve often been in the habit of prescribing coffee as a medicine in tain states of great debility. It appears to me to be a remedy te unique in its usefulness in sustaining the nervous energy in tain cases. Apart from its general usefulness, I have found it especial service after operations where anaesthetics had been d, and in states of exhaustion where alcohol had been pushed l a condition of semi-coma followed. In these latter cases I ve sometimes prescribed it as an enema when the patient could t swallow, and with the best effects. Its value as an antidote to ium is of course well-known. Tea and coffee seem to me to be ich alike in many respects, but I would give great preference the latter as to its sustaining power. It would, I think, be a at advantage to our working classes, and a great help towards further development of social sobriety, if coffee were to come o greatly increased use, and if the ability to make it well could acquired. As an example of the difference of effect of tea and fee upon the nerves, I may note, what I believe many sports- n will confirm, that it is far better to drink coffee than tea when oting. Tea, if strong or in any quantity, especially if the indi- lual be not in very robust health, will induce a sort of nervous- s which is very prejudicial to steady shooting. Under its in- nce you are apt to shoot too quickly, whereas coffee steadies hand and gives quiet nerves. My object in the present note is, wever, to illustrate the remarkable power of coffee as a restora- medicine.

n the case of an old man in whom colotomy was done in a very perate stage, he being almost moribund, good rallying took ce under injections of coffee and milk. During the first two or ee days great use was made of coffee, and I believe that the re- ery that resulted was largely to be credited to it. I have em- yed it in many similar, though less severe cases. It is my al- st invariable prescription for elderly people after an operation for ich an anaesthetic has been given. One of the most remarkable s, however, which I have ever witnessed, illustrating its powers, the following: I was called late one evening to an elderly lady om I had repeatedly seen previous on account of multiple sarco-

matous growths in her bones. She had been in an almost dying state for more than a month, and at length it seemed that her end was come. I found her in a state of deep collapse, with pale face and dusky lips, and unable to speak or recognize any one. Her breathing was short and rapid. Her daughters were attempting to force brandy into her mouth by the spoon, but she could not swallow it, and I learned that they had given a good deal of champagne and brandy during the afternoon. Her pulse, although very rapid, still beat well, and was not in keeping with her other symptoms of collapse. This made me think that probably more alcohol had been given than was useful, and I resisted the importunity of the relatives that subcutaneous injections of ether should be made. Feeling sure that she was sinking, and expecting that all would be over in an hour or two, I wished to take my leave The patient's daughters, however, in great distress, begged me to stay to the end. I waited about an hour, still refusing to administer more alcohol. At the end of that time the nose had become cold, and the face was bedewed with a clammy sweat. It was under these circumstances that, in consequence of the urgent solicitations to do something, I thought of trying a coffee enema. After the nurse had prepared it, she appealed to me as to whether she should give it, evidently thinking, as I did, that it was absurd to attempt anything in a patient so nearly dead. It was, however, administered, and with the surprising effect that within a quarter of an hour the patient opened her eyes and recognized those about her. In another half hour she spoke to us, and color began to return to her face. The coffee was repeated several times during the night, with the addition of some very small quantities of brandy. The result was that the patient recovered and lived for three weeks afterward.

"In this instance I have no doubt that alcoholic stimulants, whilst they sustained the circulation, had acted injuriously on the nervous system, and that the patient, already extremely weak, had been pushed into a condition approaching that of intoxication. It is, I believe, very easy on the deathbed to over-use alcohol, although, in the case which I have narrated, the disease being incurable and the suffering great, the prolongation of life for a few weeks was not a matter of real importance. There are, however, many others in which death may be close at hand, where an expedient such as I have described may be the means of permanent restoration to health."

ANYBODY MAY LEARN TO SWIM.

HALF HOURS OF DETERMINED EFFORT WILL ACCOMPLISH THAT RESULT.

he fact that so many lose their lives because they have never ıed to swim will, I trust, be regarded sufficient apology for ıting out the further fact that anybody may learn to swim in half hours spent in determined efforts to that end. To begin , let it be understood that the act of "treading water" consists mply remaining in one place in the water in an upright position ıotion of the arms and legs moved as a dog, horse, or ox moves egs in swimming, omitting his effort to move forward. This ng been understood, let the tyro wade out from the shore in lually deepening water until he finds himself in water, say, up is chin; then turn round, face the shore, and proceed to tread :r, continuing his efforts until he finds himself standing up- t, his feet not touching bottom. Half an hour's persistent rt will enable him to master this his first lesson. When he has e so much, he has virtually captured the whole business. When ıgain goes into the water, let him go out to the same depth, ı round, face the shore as before, and strike out in front with his ds and arms, at the same time kicking backward. He will find, ost before he is aware of it, that he is off bottom and slowly nming toward the shore. In fact, he has learned to swim. flights will be short at first. He can easily learn the common kes and methods of swimming after he has first learned to swim fashion. All he needs, however, is practice to enable him to n at will, according to his physical strength. In these sugges- s the masculine is assumed to include the feminine.—Natator, he New York Times, July 26, 1897.

)R. PARR.—Dr. Parr had a great deal of sensibility. When to , in Lincoln's Inn Fields, the account of O'Coigly's death was l, the tears rolled down his cheeks. One day Macintosh, hav- vexed him, by calling O'Coigly "a rascal," Parr immediately)ined, "Yes, Jamie, he was a bad man, but he might have been se; he was an Irishman, but he might have been a Scotchman; was a priest, but he might have been a lawyer; he was a re- lican, but he might have been an apostate."

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Disturbance of Speech in Epilepsy.—M. Nevsky (Archives of psychiatria, neurology and legal psychopathology), "Le Progres Medical," 21 August, says:

"These disturbances are still but very little studied; while they are not always present, nor absolutely the same in all cases, they have many features in common that it will be of interest to develop. The most frequent and the most important of these peculiarities are the following: 1. Slowness in pronouncing the words; this slowness is rarely continuous; most frequently and especially when the disease is advanced, words or phrases pronounced slowly, alternate irregularly with words and phrases pronounced rapidly. 2. The repetition of words or syllables and of sounds or of phrases, with a tendency to repeat several times, particularly the commencement of the phrase. 3. The prolongation of the vowels and the syllables. 4. Difficulty of motor co-ordination; difficulty of finding, at first, the attitude of the tongue and the lips necessary for the emission of the desired sound. 5. Pauses unusually long and inappropriate, especially between the syllables of the same word, or between different words. 6. Expiratory or inspiratory stammering. 7. An unnatural pitch of the voice, the emission of some very loud sounds. 8. A weakening of the voice which may end in almost complete extinction. These changes may make their appearance at the beginning or toward the end of the disease, their course is always chronic and in proportion to the progress of the intellectual debility: the different attacks are followed by an increase of the disturbance, which diminishes gradually during the periods that intervene between the attacks."

In a very severe and protracted case that came under the observation of the writer a few years ago, nearly all the irregularities noticed above were found from time to time. The one noticeably absent was the difference in the pitch of the voice. The young man, when first observed, was about twenty-one years of age, addicted to vicious habits, and about three years later became a complete imbecile. He spoke rarely, and words were elicited from him with difficulty.

TO RECOGNIZE HORSE-FLESH.—"La Journal d'Hygiene," of ıe 5th of August, gives the following as a means of recognizing orse-meat, even when mixed with the meat of other animals:

The best process is based on the well known reaction of iodine n glycogene, which, even if in variable quantity, is found always ı the flesh of the horse. The following is the German method of roceeding:

1. A small quantity of the meat to be analyzed—50 gr.—is hopped as fine as possible. It is then boiled for an hour in four mes its weight of water. . . .

2. Then there is added caustic potasa (equal to 3 per cent. of the ıeat) dissolved in a like quantity of water, and this is again heated ntil the muscular fibres are dissolved.

3. The decoction of meat thus obtained is collected, evaporated ntil the weight is double that of the meat used, and is then filtered.

4. This solution of meat, having becóme completely cold, is :eated with dilute nitric acid, in order to remove the color and to eparate the greater part of the albuminoid substances; it is again ltered.

5. While the meat gelatin obtained by the process No. 1 is reated with dilute nitric acid, the product of No. 4 is treated with perfectly saturated solution of iodine, warmed.

The solution of iodine thus obtained is poured gently on a filter ı a test tube over the flesh of the horse, and there is formed imme- iately, at the line of contact of the two liquids, a ring, brownish- ed, approaching violet, the color of which, both in force and in ıtensity, depends on the quantity of horse-meat contained in the :st tube, in proportion to the quantity of glycogen. By this ıethod 5 per cent. of horse-flesh added to other kinds of meat can e detected.

This process is recommended to military confreres, in the ab- ence of chemists and pharmacists.—Dr. M. de T.

NERVOUS LESIQNS IN LA PESTE.—M. Nepveu, of Marseilles 'La France Médicale, 20th of August), says: In very fine cuttings f the cerebral circumvolutions, bacilla are found scattered here nd there, or gathered together in little groups, particularly umerous in the veins, or they are found on the walls or in the clots ı the sub-arachnoid space. Great numbers of leucocytes are ound, becoming more rare as the investigation is pursued deeper. he capillaries are congested; they contain, besides the great quan- ties of leucocytes, the bacilli of the plague, which may be seen

very distinctly by coloring them with the blue of Loeffler or with thionine, the method employed by the head of the laboratory, M. Hagenmuller.

An abundant leucocytic diapadesis is found around the capillaries and the nerve cells of the cerebral cortex. These cells are sometimes flattened, or compressed, and sometimes even partly atropied by the action of five, six to ten leucocytes. In this case the chromatic substance and a good part of the protoplasm have disappeared; the nucleus is very much reduced in volume.

These minute details are studied by the use of chloride of gold. The employment of this salt enables us to see that the rich cylindrical plexus that surounds the cells has in part disappeared, that the intra-cellular chromatic substance is reduced in quantity and in coloration, that the protoplasmic prolongations of the cells are most altered in the form of granules and in a state of degeneration. These lesions are due to the active congestion, to the compression by the leucocytic diapadesis and the consequent cerebral oedema.

ACTION OF WARM DRINKS.—M. Montagon ("La France Médicale," 20th August) says that warm drinks between 40° and 45° C., have a distinct action on the mobility of the stomach. This action has been determined by a series of comparative meals as tests and withdrawn by the sound and by washings at certain hours during digestion. They have no action, as proved, on the secretion of gastric juice. The use of warm drinks is indicated in atonic cases with chronic dilatation or not.

These drinks can afford special benefit in hyperchlorhydric cases, whether simple or complicated with hypersecretion, with symptoms of ectasis, and in cases in which it is desirable to increase the activity of the process of evacuation without exciting the secretion.

THE RADICAL CURE OF HERNIA.—M. Championnière ("Le Progrés Médical, 7th of August) recently presented to the Académie de Médicine an interesting communication on the conditions of solidity in the radical cure of hernia.

The communication showed that an indispensable condition to insure solidity in the radical cure of hernia is the suppression of the deep infundibulum and the complete restoration of the walls throughout their whole extent. Injections of chloride of zinc will not meet this condition. The observations of M. Lannelongue are, besides, quite recent and extend back not more than a

few months, so that it is impossible to say if a relapse will happen, although it may be feared. The operation, if complete, insures the patient against a possible relapse, even in the case of workmen who do not wear a bandage. In the case of young subjects, free from all organic taint, the mortality from the operation does not exceed one in five hundred. The operation must, however, be made very complete. The steps indispensable for success are the following: A large opening of the hernia down into the abdomen, so as to see and to repair the injury as far as possible. The removal of all the epiploon accessible. The destruction of the sack and of its superior infundibulum. The removal of all folds of the peritoneum from the neighborhood of the hernia. The reparation of the walls by crossing or lapping, and not by simple reunion of edges, the object is to double the wall of the whole region. Closing the wound with drainage. In this way the operator may succeed in effecting a complete reparation of the weakened tissue of the walls. But success will never follow unless the operation is very carefully performed and very complete.

EXCISION OF A TUBERCLE FROM THE CONJUNCTIVA.—M. Valude ("Gazette Hebdomadaire," 15th August) recently presented to the Académie de Médicine a case in which tubercle had attacked the whole of the sclerotic, extending to the border of the sclerotic of the cornea.

The parts attacked were removed and the edges of the incision were brought together. The eye was preserved. This eye would certainly have been enucliated if the method of treatment followed by oculists generally had been pursued. The patient had a lupus on the face that complicated the tubercle in the eye.

X RAYS APPLIED TO THE STOMACH.—MM. Roux and Balthazard ("Gazette Hebdomadaire," August 1) have applied the X rays to a man after the ingestion of a certain quantity of bismuth. Experiments made successively on frogs and dogs have clearly shown the form of the stomach at the time of digestion. They have seen that the stomach of man, like that of the frog and the dog, presents two distinct parts: The larger serves as the reservoir for the food ingested; the smaller, which is the prepylaric portion of the stomach, is the only part that undergoes any movement; these movements are violent and peristaltic, contrary to the opinions advanced by Hofmeister and Schutz; it forces little by little into the duodenum the matter that has accumulated in the stomach.

HYDATIC CYST OF THE LIVER.—M. Boinet, of Marseilles ("Gazette Hebdomadaire," 1st August) lately presented the case of a patient who had a very voluminous cyst of the liver. The first puncture was rapidly followed by the reproduction of the liquid. Then three needles connected with a current of from 15 to 25 miliamperes, from the positive pole of a battery, were passed into the cyst. At the end of ten days a second puncture was made from which a syrupy liquid issued, which contained a ptomaine which, injected into some of the animals in the laboratory, was followed by severe toxic results.

After the evacuation of this syrupy liquid the cyst disappeared, the liver contracted to its normal size, and the patient recovered completely. He died two years later of pulmonary tuberculosis.

Was the syrupy consistence of the liquid caused by the electric current; would the negative pole have caused the same result?

THE STERILIZATION OF WATER.—A simple method of sterilizing water has been devised ("Practical Engineer"), by Dr. Schumburg, chemist to the German Army Medical Academy. He finds that the ordinary means of filtration by portable filters is unsatisfactory, but asserts that a solution of bromide destroys the pathogenic germs, and that the subsequent addition of ammonia renders the water palatable. Dr. Schumburg has made a number of experiments with water to which pathogenic germs had been added, and among them one or more in which a liter of water from the Spree was sterilized by the addition of 0.2 gramme of a solution of 20 grammes of bromine and 20 grammes of bromide of potassium in 100 grammes of water. The bromine is removed by a dose of a 9 per cent. solution of ammonia. It is possible that some simple mixture may be devised, the addition of which to doubtful water will render it perfectly safe, so far as the pathogenic germs are concerned.

AN HYPNOTIC FOR CHILDREN.—In the "International Medical Annual and Practitioner's Index," 1897, Dr. H. D. Chapin, Professor of Diseases of Children in the Post Graduate Medical School and Hospital, writes as follows: "Dr. Moncorvo ("Bulletin de l' Acad. de Med."), has experimented with Trional as an hypnotic in children. It had so far shown good results. It has succeeded perfectly in the insomnia of the eruptive fevers—measles, scarlatina, variola, and in malaria. The dose employed was three to four grains before bedtime. Children show a particular tolerance for Trional. Given in warm, sweetened milk, between the limits of

three to fifteen grains in the twenty-four hours, it might be continued for several days in succession. In conclusion, Trional seemed to be the hypnotic the most prompt to act and the best borne."

INDOLENCE AS A FAT PRODUCER.—A woman has recently died at Teignmouth, in Devonshire, who was certainly one of the most logical and consistent of her sex. One evening in 1858, when she was thirty-eight years of age and in perfect health, she retired as usual. Next morning she said that bed was the most comfortable place in the world, and announced her intention of remaining there for the rest of her natural life. This determination she calmly carried out. The London papers do not tell what the woman's name or station was, from which fact one may conclude that she was a person of good family, and it is certain that she had some wealth, for she not only had property affairs to attend to, but she looked after them with intelligence and success. For two years she lay in an upstairs room, and for thirty-seven her bed was placed in one on the ground floor, commanding the entrance to the house and grounds. From this vantage point, by an ingenious arrangement of mirrors, she could see everything that went on around the house and in the garden; while her sense of hearing became so acute that nothing transpired inside its four walls which escaped her attention. Neither the death of her father nor that of her mother, which took place after she had retired for this long rest, operated to alter her resolution. Neither did she change her diet in any way, but, despite her recumbent habit of life, continued to eat her usual meals, dining at 8, and consuming such things as ducks, game, peaches, pork and all things digestible, and taking her coffee and liqueurs regularly all her life. Doctors visited her, but she had no need of their prescriptions, and it was only a few months ago that the effects of her extraordinary manner of life began to be visible. Then she gradually failed. At her death she weighed nearly seventeen stone, and the coffin in which she was buried was the largest ever made in South Devon. She was no miser, but lived well, gave freely, and handed on her fortune unimpaired to her collateral descendants.

A CURIOUS STINK-PLANT.—When Mr. G. A. Farini, on his return from an exploring tour of the Kalahari Desert in South Africa, a few years ago, arrived at Upington, he was shown a plant without leaves, resembling a cactus, the fleshy stems growing in a

bunch, with a border of flowers about ten inches across, and looking as if cut out of purple-brown velvet, marked throughout with bright golden hieroglyphics. This plant was called by Mrs. Scott, the wife of the resident commissioner, the "carrion plant," and it well deserved this name, for when disturbed it emitted an odor which was perfectly unendurable. Mr. Farini had already come across the plant on his route through the desert. At one time he was attracted toward it by the brilliant golden markings on the deep, rich-toned flower head. He dug up a specimen, but as soon as it was disturbed it threw out such a sickly odor that he nearly gave up the job in disgust. However, he persevered, and put it into the wagon, but it soon protested against the jolting of the vehicle, and emitted such a pungent stench that the driver had to get out and walk. When they halted it was placed behind a bush, and even then its odor made Mr. Farini's companion "sea-sick," and made the former so drowsy that he was obliged to bury it bodily beneath the sand. While doing this, the narcotic effect was so powerful that he nearly fell asleep. The second time when he encountered the plant he was inclined to give it a wide berth, but he brought home some small specimens which were placed in the charge of the authorities at Kew Gardens. According to the appendix attached to Mr. Farini's work (page 449), the plant is a species of Stapelia. Further information on this interesting plant is much desired, and will probably be furnished by the botanists at Kew.—American Druggist.

THE MYSTERY OF HEREDITY.—Out of 222 pupils in the grammar schools of Chicago who attained a certain percentage of efficiency, only twenty-five were boys. This would indicate that girls are about four times as bright as boys. It is hard to understand these things and to straighten up the rules of heredity. It is, we believe, the accepted rule that boys "take after" their mothers and the girls after their fathers. If, then, the women are the smartest, the boys, "taking after" the mother, should also be smartest. If the men are the smartest, then the girls, "taking after" the father, should be smartest. It is a difficult riddle to unriddle.—Baltimore

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LANDSEER, the great animal painter, once asked the late Rev. Sydney Smith if he would grant him a sitting, whereupon the Rev. Canon biblically replied: "Is thy servant a dog that he should do this thing?"

EDITOR'S TABLE.

SANITARIAN, OCTOBER NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE YELLOW FEVER OUTBREAK.

The recent occurrence of yellow fever on the Gulf Coast is true o the history of the disease there as elsewhere. Wherever it is vont to prevail the locality is marked by the excessive accumula- ion of vegetable matter on the surface and in the subsoil, in a nore or less putrescible condition; by defective, or total lack, of oil drainage and sewerage; and by a prevailing temperature of bout 80°. These conditions appear to have reached a climax bout a month ago in the cities and towns of the Gulf Coast, when he yellow fever broke out in Ocean Springs; and since in other laces in the vicinity, under similar conditions.

It is no scandal on the civil authorities of those communities to tate that they have become so wedded to the exclusive belief in the xotic origin of yellow fever as to have relied wholly upon their uarantines for its prevention, while they have neglected local onditions and the extensive prevalence of such other diseases as ave been the common forerunners of yellow fever in the same ocalities heretofore; as they have been in other places, during eriods of prevailing temperature approximating the average com- ion to outbreaks of yellow fever, when the conjunction occurs. t is liable to break out in, or to be introduced into, such places nly.

Localities may be never so dirty, and other diseases prevail ex- ensively, but so long as they are not subject to an average tem- erature of about 80°, they are not subject to yellow fever; and if t happens to be introduced into them it never spreads; it is limited o the cases introduced. And in like manner, clean localities, hough subject to an average temperature of 80° the year round, re never subject to yellow fever; if a case is introduced, the disease ever spreads. The disease requires dirt and high temperature to- gether for its propagation. Clean localities need have no fear of it nder any circumstances; dirty places have reason to fear it when- ever there is a prevailing temperature of about or above 80°.

It is communicable by *fomites*—infected things—and is not contagious like measles, smallpox or other contagious diseases. And considering the supersusceptible conditions and consequent liabilities to the disease common to all the populous localities along the Gulf Coast at this time—so abundantly shown by their own published discoveries since the outbreak—the attempts of the authorities of the localities to quarantine one another, is preposterous and disgraceful in the extreme. And as for "shotgun" quarantines and cordons against infectious diseases of any kind or at any time, they are alike cowardly and inhuman.

There are a few persons in the health service thereabout old enough to remember the twofold practical lesson at Memphis and New Orleans, 1878-'79, and those who are not old enough to remember it should have learned it before undertaking the duty of health officers: that the introduction of the disease and its prevalence were alike shown to have depended upon *unclean localities* and the dissemination of *unclean things*, and not upon personal intercommunication; and that it was by the restriction and disinfection, or destruction of such things, and the thorough cleaning and disinfection of the localities, that the disease was promptly checked and finally stamped out. But some of those now in authority seem to have no recollection or knowledge of other means than those which were subsequently used in Texas and Florida, while the disease continued to prevail until the coming on of cool weather, to which time the authorities postponed the cleaning up, and then claimed the credit due to the weather!

It is always estoped by the setting in of frosty weather, or by prevailing "northers" on the Gulf Coast, under a temperature of about fifty degrees.

Practical Sanitation means the prompt rescue of both the sick and the well from infected places and infectious things, and the needful provision for the sick; the promotion of facilities for the well to reach healthful localities, subject only to such temporary detention as may be necessary to divest them of all infectious things; and the utmost dispatch in cleaning up and disinfecting the locality. We make no attempt to present a record of the disease in its progress, because the public press renders any such attempt wholly unnecessary.

THE YELLOW FEVER BACILLUS discovered by Professor Sanarelli, of which we published a description in our March number (Vol. XXXVIII., p. 276), appears to be a mere rediscovery of Dr.

Sternberg's bacillus *x*, discovered and particularly described by him, eight years ago, but not announced by him as the bacillus of yellow fever, because, he states in a paper read at the recent meeting of the International Medical Congress in Moscow, "scientific conservatism compelled me to withhold any announcement of a discovery in view of the fact that I had failed to obtain this bacillus in a considerable number of undoubted cases of yellow fever."* In summing up his subsequent researches and facts, with special reference to the false claims of Carmona, Freire and others, he confesses to having felt it necessary to be exceedingly careful lest he also should make a mistake by premature announcement, and says that, had he found the bacillus in every case of yellow fever which he had studied, he might have made bold to announce it as such. Had he even found it in eighty or ninety per cent., it might have given him courage to announce the great probability of its being the long-sought-for microbe. But as he only found it in about half the fatal cases then examined, he could not very well announce it as the cause of every case. In this paper, he now says that "if he had had the results announced by Sanarelli on dogs, monkeys, and men, he would not have hesitated as he did." And he further adds: 'If these results (of Sanarelli's) are confirmed by other investigators, this bacillus must be accepted as the veritable germ of yellow fever."

THE MILK SUPPLY OF NEW YORK.—According to the report of the board of health for 1896, the number of cows which furnish milk for this city is 115,570. There are 7,000 places in the city where milk is sold both wholesale and retail. The system of granting permits to venders of milk, which went into effect at the commencement of the year 1896, has been found to be of great value. As a result of this, together with the application of the tuberculin test to milch cows, there is now a system of milk inspection which is as perfect as is possible at the present day and with the present force. The milk permits are in force during the pleasure of the board of health, which revokes them on the second trial and conviction for the sale of "adulterated milk," that phrase meaning milk containing more than eighty-eight per cent. of water or fluid and less than four per cent. of milk solids, or less than three per cent. of fat, milk drawn from animals fed on distillery waste, milk

*American Journal of Medical Sciences, September, 1895.

from which any part of the cream has been removed, and milk from cows kept in crowded or unhealthy places. In 1895, in the samples of milk which were tested, 393 cases of adulteration were discovered, while last year the inspection and test showed only 233. The number of arrests in 1895 for selling adulterated milk was 408; in 1896 there were only 220. Nevertheless, in view of the liabilities to impure milk and to deteriorated milk, it is, to say the least, very regretable that Nathan Straus should have been given such offense by an employe of the board of health, on account of what appears to have been the unfaithfulness of one of his employes, as to have caused him to discontinue the supply of sterilized milk to the many thousand babies in the city, whose mothers are otherwise unable to obtain it. Attention is invited to Mr. Straus' letter to this effect, on another page.

THE SPITTING REFORM—HOW IT BEGAN.—A Kentucky tobacco planter visited a merchant in New York about sixty years ago, with whom, after dinner, he drank wine and chewed tobacco, spitting on the carpet (not having been used to carpets at home) much to the annoyance of his host, who desired a spittoon to be brought for his visitor; he, however, pushed it away with his foot, and when it was replaced, he kicked it away again, quite unaware of its use. When it had been thrice replaced, the Kentuckian drawled out to the servant who had brought it: "I tell you what: you've been pretty considerable troublesome with that ere thing, I reckon; if you put it there again, I'm hung if I don't spit in it."

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrahams, M. D., Health Officer. reports for July: Deaths, 77—29 under five years of age. From typhoid and typho-malarial fevers, 4; consumption, 7. Annual death rate, 24.3.

September 13, there was one malignant case of yellow fever in the city, and other suspicious cases.

CALIFORNIA.—C. A. Ruggles, M. D., President, Stockton; W. P. Matthews, M. D., Secretary, Sacramento.

San Francisco, 360,000. Reports for July: Deaths, 470—119 ıder five years of age. From consumption, 70; acute pulmonary iseases, 46; from zymotic diseases, 29; diphtheria (and croup), 5; 'phoid fever, 3. Annual death rate, 15.6. Contagious diseases :ported during the month: Diphtheria, 13; scarlatina, 8.

Los Angeles, 107,000. Reports for July: Deaths, 121. From hthisis, 19; acute pulmonary diseases, 6. Annual death rate, 4.04. "N. B.—Of the 19 deaths from pulmonary consumption, s follows: Natives of Los Angeles, 1; natives of the Pacific Coast utside of Los Angeles, 0; from other parts, 18. Of the 19 deaths 6 had lived here less than ten years."

Alameda, Aug. 7.—The Board of Health decided to ask the City rustees to pass an ordinance forbidding the distribution of ımples of patent medicines about the city. Several of the mem- :rs reported cases of children being taken sick from eating these ımples, which are thrown in dooryards and public places.

Colorado.—Denver, 160,000. William P. Munn, M. D., Health Commissioner, reports for July: Deaths, 166. Of these t were caused by consumption, 26 contracted elsewhere; 13 by :ute pulmonary diseases. Annual death rate, 12.45 (excluding hthisis contracted elsewhere), 10.50.

Connecticut.—Professor William H. Brewer, Ph.D., New .aven, President; Professor C. S. Lindsley, M. D., Secretary, ew Haven. The Secretary's bulletin for August comprises re- ırns from every town in the State. There were 1,237 deaths re- ›rted during the month; 12 more than in July, and 407 less than ıe average number of deaths in August for the five years preced- g the present.

The death rate was 16.9 for the large towns; for the small towns 5.2, and for the whole State 16.8. Deaths from zymotic diseases, 56, being 29.0 per cent. of the total mortality. From diphtheria, 4; typhoid fever, 15; whooping cough, 12; measles, 2; scarla- na, 5; cerebro-spinal fever, 18; malarial fever, 18.

District of Columbia, 276,963—88,176 colored.—Wm. C. Woodward, M. D., Health Officer, reports the mortality for four 'eeks ending August 28: 395. Of the decedents, 188 were white nd 207 colored, the death rate being 14.1 for the white, 35.0 for he colored, and 24.5 for the whole population. The principal auses of death were: Zymotic diseases, 96; constitutional, 75; 40 vere from consumption and 15 were from pneumonia. Of the

zymotic class there were 5 fatal cases of diphtheria, 13 of typhoid fever, and 23 of whooping cough.

GEORGIA.—Noble Atlanta!

"ATLANTA IS WIDE OPEN."

"Atlanta, Ga., Sept. 12.—Atlanta will welcome people from New Orleans, whether provided with health certificates or not."—Special to the Times-Democrat.

This is of twofold import: It shows knowledge of yellow fever and confidence in the sanitary condition of Atlanta.

Yellow fever is *not introducible* into any locality under good sanitary conditions.

ILLINOIS.—L. Adelsberger, M. D., President, Waterloo; J. A. Egan, M. D., Secretary, Springfield.

Chicago, 1,619,226. A. R. Reynolds, M. D., Commissioner, reports for August: Deaths, 1,967—1,058 under five years of age. From diphtheria, 47; typhoid fever, 42; consumption, 153; pneumonia, 66; bronchitis, 41; diarrhoeal diseases, 396. Annual death rate, 13.44.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

School sanitation.—A general order has been issued requiring a thorough renovation of all schoolhouses, as follows: "The renovation should consist, first, in making such repairs to the house and furniture as may be necessary; second, in cleaning with lye water and soap floors, desks and woodwork which were in use the past year; third, in revarnishing desks and repainting woodwork where this has not been done for two or more years; fourth, in supplying abundantly and properly pure drinking water; fifth, in furnishing separate closets or privies for the sexes, which shall be clean and decent in every respect; sixth, in providing proper heating apparatus which introduces to the schoolroom proper air, which it heats and evenly distributes; seventh, in supplying to the windows dark shades which roll up from the bottom, that light may be admitted from over the heads of the pupils, thus preventing injury to eyes. Failure to comply with this order will be followed by the proper legal process to compel compliance."

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board Bulletin for July, reports since preceding: Diphtheria, 6 localities; scarlatina in 2; measles in 5.

Davenport, 35,000. W. L. Allen, M. D., Physician to Board of ealth, reports for July 40 deaths—15 under five years of age. ymotic diseases caused 9 deaths; consumption, 2.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. atton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored. Deaths in July, 520; olored. 197; 170 under five years of age. 64 colored. Deaths om consumption, 61; pneumonia, 8; bronchitis, 4; diphtheria, 2. eath rates—White, 14.88; colored, 29.55: 22.69.

September 18.—Cases of yellow fever reported up to this date, 3, with two deaths; and the aspect of the disease somewhat dis-ouraging—occurring in widely distant sections of the city without ny traceable communication with other infected localities or per-ons. Its conditions are more fully described on a preceding page.

MAINE.—C. D. Smith, M. D.. President, Portland; A. G. oung, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; John Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M.D., Health Commissioner, reports for July. The weather: The mean arometric pressure during July was 29.96 inches; mean tempera-ure, 77°; total precipitation, 6.93 inches, an excess in precipitation uring the month of 2.17 inches; prevailing direction of wind, est. Mortality, 961, a decrease of 268 compared with the corre-ponding month of July, 1896. Of these 725 were whites and 236 olored; a death rate of 20.18 per thousand for the former and 37.76 er thousand for the latter. The death rate per thousand for the hole population was 22.79. Thirty-one died from infectious dis-ases, 68 from consumption, 19 from pneumonia, 25 from enteritis, 2 from enterocolitis, 13 from Bright's disease, 116 from cholera nfantum, 23 from diarrhoea, 13 from typhoid fever, 56 from gas-roenteritis, 4 from cholera morbus and 12 from dysentery. 560, r 61.13 per cent., of the total deaths were in children under five ears of age. Ninety-nine deaths occurred in public institutions, f which twenty-three were reported as non-residents. Cases of nfectious diseases reported during the month, 189, a decrease of 8 compared with the preceding month.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cam-ridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 516,395. Samuel H. Durgin, M. D., Chairman of Board of Health.

During the month of July there were 948 deaths, of which number 410 were under five years of age. Annual death rate, 22.03 per 1,000. Deaths from diphtheria (and croup), 33; scarlatina, 6; typhoid fever, 10; cerebro-spinal meningitis, 19; consumption, 78. Cases reported: Diphtheria, 183; scarlatina, 74; measles, 173; typhoid fever, 20.

August 20 ("Traveler").—The vital statistics of the North End show the highest death rate from typhoid fever of any district of the city, while that of scarlet fever is also high, and deaths from consumption are in a large percentage. This seems mainly due to the unhealthful, disease-breeding environment. The statutes and ordinances require that every tenant shall have suitable receptacles for garbage and other refuse, but in the North End the receptacle is too often the street, which is not suitable in any sense.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

Registration of Deaths.—Extract from recent law:

"Section 1. The People of the State of Michigan enact, That the body of no person whose death occurs in the State shall be interred, deposited in a vault or tomb, or otherwise disposed of, or removed from the township, village or city in which the death occurred, until a permit for burial or removal shall have been properly issued by the clerk of the township, village or city in which the death occurs, who shall be the registrar of deaths. . . .

"Sec. 2. Whenever any person shall die, the undertaker, householder, relative, friend, manager of institution, sexton or other person superintending the burial of said deceased person, shall cause a certificate of death to be filled out with all the personal and family particulars required in section three of this act, and attested by the signature of a relative or some competent person acquainted with the facts. The physician who attended the deceased person during his last illness shall fill out the medical certificate of cause of death. . . . Upon the presentation of a certificate of death properly filled out and signed, the registrar shall issue a permit for the burial or removal of the body and shall immediately record the death in the register of deaths.

"Sec. 6. Any official failing or refusing to perform his duty under this act, or any undertaker violating any of its provisions, shall, upon conviction thereof, be deemed guilty of a misdemeanor,

nd shall be punished by a fine of not less than five dollars and not xceeding one hundred dollars, or be imprisoned in the county ail not exceeding thirty days, or suffer both fine and imprisonnent at the discretion of the court. Local registrars shall see that he provisions of this act are enforced in their jurisdictions."

The Secretary reports for the month of August, 1897; compared vith the preceding month, dysentery, intermittent fever, diarrhoea, holera morbus, cholera infantum and tonsilitis increased, and inlammation of kidneys decreased in area of prevalence For the nonth of August, 1897, compared with the acerage for August in he eleven years 1886-1896, influenza was more prevalent, and remittent fever, dysentery, cholera infantum, intermittent fever, holera morbus, consumption and inflammation of bowels were ess prevalent. Including reports by regular observers and others, consumption was reported present in Michigan in the month of August, 1897, at 193 places; measles at 52 places; diphtheria at 39 places; scarlet fever at 28 places; whooping cough at 23 places, and typhoid fever at 56 places. Reports from all sources show consumption reported at 2 places more; measles at 43 places less; diphtheria at 8 places less; scarlet fever at 4 places less; whooping cough at 6 places less, and typhoid fever at 29 places more in the month of August than in the preceding month.—At the State capital for the month of August, 1897, compared with the average for August in the eleven years, 1886-1896, the prevailing direction of the wind was northwest (instead of southwest), the velocity was .3 of a mile per hour greater, the temperature was 2.01 degrees lower, the absolute humidity was less, the relative humidity was more, the day and night ozone less, and the depth of water in the observation well was 1 inch less.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, reports for June: Total mortality, 500—208 under five years of age. Annual death rate per 1,000, 18.02. Consumption, 14; pneumonia, 30; diphtheria, 8; scarlatina, 8; measles, 1. Cases reported: Diphtheria, 75; typhoid fever, 1.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602. H. N. Avery, M. D., Commissioner, reports for July: Deaths, 150—61 under five years of age. Deaths: Consumption, 17; typhoid fever, 12. Annual death rate, 8.08.

St. Paul, 215,582. A. J. Stone, M. D., Commissioner. Mor-

tality for July, 141—58 under five years of age. Deaths from diphtheria, 1; consumption, 18; pneumonia, 4. Annual death rate, 7.84.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Paul Paquin, M. D., Secretary, St. Louis.

Sept. 11 ("St. Louis Republican").—"Yellow fever must keep out of Missouri. The State Board of Health is following the disease closely, and at the first intimation of danger will establish a strict quarantine at St. Louis and other points throughout the State. Dr. Paul Paquin, secretary of the Board, is in constant communication with the health authorities in the infected districts, and receives reports from them both by mail and telegram daily. Should the scourge increase at an alarming rate he will leave immediately for New Orleans in order to study the quarantine methods in operation there"!

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for July: Deaths, 925—382 under five years of age; from zymotic diseases, 215; diphtheria, 3; whooping cough, 5; typhoid fever, 10; phthisis, 53; pneumonia, 26; diarrhoeal diseases, 190. Annual death rate, 17.7.

Kansas City, 175,000. E. Von Quast, M. D., Health Officer, reports for July: Deaths, 189—74 under five years of age. Deaths from typhoid fever, 1; phthisis, 8; tuberculosis, 9; pneumonia, 9. Annual death rate, 12.9.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Paterson, 107,056. J. L. Leal, M. D., Health Officer, reports for July: 223 deaths—138 under five years of age. Annual death rate, 20.7. Deaths from diphtheria, 6; consumption, 15; pneumonia, 2.

Newark, 230,000. Health Officer Chandler reports for the three weeks ending August 28: Deaths, 235—94 under five years of age; from diphtheria, 8; consumption, 7; pneumonia, 10; other respiratory diseases, 13. Annual death rate, 17.7.

Hudson County (Jersey City and vicinity), 355,231.—W. W. Varick, M. D., President.

NEW MEXICO.—The Territorial Board of Health met at Albuquerque, June 27, and organized by the election of the following officers: Dr. W. R. Tipton, president; Dr. J. W. Kinsinger, vice president; Dr. J. M. Cunningham, secretary; Dr. G. S. Easterday, treasurer.

NEW YORK.—Daniel Lewis, M. D., President, New York; S. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for July reports that the month has been characterized by the usual increase in diarrhoeal diseases, but to a less degree than normal. The reported mortality for the month, 11,235, is greater by 2,200 than that of the preceding month, but is less by 1,400 than that of the corresponding month of last year, and is the smallest reported in July since 1890. Compared with the preceding month, deaths from diarrhoeal diseases increased from 500 to 2,400; there were 300 more deaths reported from diseases of the digestive organs; 200 more from accidents and violence; and 200 more from indefinite unclassified causes. On the other hand, of zymotic diseases, diphtheria decreases by 100 in mortality; scarlet fever and measles decreased somewhat; while typhoid fever shows a moderate increase; acute respiratory diseases have diminished by 250, other local diseases showing no material variation. In June 8.5 per cent. of the deaths were from zymotic diseases other than diarrhoeal, and in July 6.0 per cent. The death rate from all causes was 20.50, against 16.75 in June; 25.5 per cent. of the deaths occurring under five years of age, against 31.5 per cent. last month. Compared with the average July mortality, there were 600 fewer deaths and the infant mortality was less by 850, the diarrhoeal mortality being less by 750; deaths from accidents and violence are 200 above the average reported. In the maritime districts 26.65 per cent. of the deaths were from the diarrhoeal diseases, in the Lake Ontario and Western district 17.70 per cent., in the Hudson Valley district about 15.00 per cent., and in more rural districts from 5.00 to 8.00 per cent. The rainfall of the month was 6.20 inches, an excess of 2.50 inches, one-third of the days being clear, the mean relative humidity 76 per cent., the average temperature being normal with high ranges (94°), winds southwest, of moderate velocity.

New York City, 1,995,000. Report for July: Deaths, 4,022—2,209 under five years of age. Death rate, 23.75. Zymotic diseases per 1,000 from all causes, 315; diphtheria, 127; typhoid fever, 29; cerebro-spinal fever, 31; consumption, 392; acute respiratory diseases, 279; diarrhoeal diseases, 957.

The annual report of the Board of Health for 1896, just issued, is a volume of 452 pages. It includes reports of the several bureaus of the board, many tables of comparative figures, and colored maps showing the distribution of tuberculosis, the inspection

districts, milk producing, food supply, stable and slaughter house districts.

Of the 55,623 births in the city during 1896, a decrease of 13 from the number in 1894, there were 865 more males than females. There were 419 pairs of twins. The Thirteenth Ward has the largest birth rate per thousand—60.05—the Tenth being second with 46.9. These are tenement house districts. The lowest rate is in the Third Ward, where it is only 7 per 1,000. After that the lowest are in the wards inhabited by the more prosperous classes.

Of the 20,513 marriages, two were of white men to colored women, eighteen were of white women to colored men, one Japanese and eleven Chinamen married white women, and one white man married a Japanese woman.

There were 384 suicides during the year, of which 276 were foreign born and only 108 native; 295 were men, and 89 women. Gunshot wounds constituted the favorite method; carbolic acid was next in popularity, with 58 victims, while 54 hanged themselves, and 35 died by illuminating gas.

Of the total of 41,622 deaths, only 5 were of persons more than 100 years old. The oldest of these was an Irishwoman, Catherine Clark, who died of sunstroke when 103 years, 1 month and 19 days old. Only one of the centenarians was a native of this country.

Death rate, 21.52 per 1,000. Deaths from phthisis, 4,994—12.24 per cent. of the total mortality. There was a decrease of 211 from this cause from the preceding year. The total decrease of deaths from prevailing causes from the preceding year was 2,773. The most remarkable increase was from sunstroke, 680, in the total deaths, on ten-year average.

Tables are given to illustrate the effects of better street cleaning. These show that the reduction in the death rate, especially among children in the filthiest and most crowded wards, followed closely the improvement in the cleaning of the streets, the mortality showing in these wards a decrease of 5.3 per cent.; and of the deaths from diarrhoeal diseases, 23.3 per cent.

Brooklyn, 1,100,000. Report for July: Deaths, 2,365—1,435 under five years. Death rate, 25.18. From zymotic diseases, per 1,000, from all causes, 357.25; diphtheria, 60; typhoid fever, 12; consumption, 157; acute respiratory diseases, 131; diarrhoeal diseases, 103.

Buffalo, 350,000. Report for July: Deaths, 435—188 under five

'ears. Death rate, 14.9. From diphtheria, 5; acute respiratory liseases, 30; consumption, 32; typhoid fever, 8.

Rochester, 170,000. Report for July: Deaths, 187—50 under ive years. Death rate, 13.1. From consumption, 17; acute res-)iratory diseases, 13.

Albany, 100,000. Report for July: Deaths, 175—60 under five 'ears. Death rate, 21.6. From typhoid fever, 5; diphtheria, 5; :onsumption, 14; acute lung diseases, 20.

Syracuse, 120,000. Report for July: Deaths, 149—49 under ive years of age. Death rate, 14.2. From diphtheria, 7; acute 'espiratory diseases, 10; consumption, 16.

NORTH CAROLINA.—George G. Thomas, M. D., President, Wilnington; Richard H. Lewis, M. D., Secretary, Raleigh.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cases of and deaths from infectious diseases reported to the State Board of Health during the four weeks ending August 28, 1897: Diphtheria, 131 cases, 17 deaths; scarlatina, 80 cases, 0 leaths; typhoid fever, 151 cases, 33 deaths; whooping cough, 50 :ases, 11 deaths; measles, 61 cases, 0 deaths. Aggregate popula-ion represented, 1,239,461.

Cincinnati, 405,000. J. M. Withrow, M. D., Health Officer, 'eports for July, 578 deaths—213 under five years of age. Annual leath rate, 17.12. From consumption, 46; pneumonia, 11; bron-:hitis, 8; zymotic diseases, 113; diphtheria, 5; typhoid fever, 17.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports or the month of July: Deaths, 610—368 under five years. From liphtheria, 5; typhoid fever, 7; consumption, 15; tuberculosis, 15;)neumonia, 20; bronchitis, 7. Death rate, 20.9.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philalelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,214,256. Theodore B. Stulb, Health Officer, re-)orts for the four weeks ending August 28: Deaths, 1,635—700 inder five years of age. From diphtheria, 89; typhoid fever, 38; :onsumption, 149; pneumonia, 69; cholera infantum, 187; scar-atina, 15. Annual death rate per 1,000, 13.5.

Pittsburg, 285,000. Report for the four weeks ending August 28: Deaths, 413—212 under five years of age; typhoid fever, 14; :onsumption, 30; diphtheria, 7; diarrhoea, 38. Death rate, 18.8.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending August 28: Deaths, 119—93 colored. Under five years of age, 42. Annual death rate—white, 11.5; colored, 33.0; 22.3.

TENNESSEE.—J. A. Albright, M. D., President, Somerville; J. Berrien Lindsley, M. D., Secretary, Nashville.

WASHINGTON.—Seattle, 60,000.—R. M. Eames, M. D., Health Officer, reports for July, 34 deaths. Annual death rate per 1,000, 6.7. Deaths from consumption, 2; pneumonia, 4; typhoid fever, 2.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 275,000. Walter Kempster, M. D., Commissioner of Health, reports for July: Deaths, 273—97 under five years of age. Annual death rate per 1,000, 11.9. Diphtheria caused 10 deaths; consumption, 23; acute respiratory diseases, 12.

The Commissioner reports on a recent inspection of the public schools of the city ("Sentinel," August 20) that in nearly all of them ventilation is poor and in most of them the water closets are out of order, creating a nuisance; in several of the schools there is an insufficient supply of water, either for drinking or cleaning purposes; in many the floors are water-soaked, creating an odor which is unhealthful. In none of the schools are the arrangements for supplying drinking water, or for washing the hands and face, what they should be. Cups in many schools are said to be washed once a week—there are some reasons for doubting that they are so cleansed. In a number of schools the janitors admit that the towels are changed once a week, or once in two weeks; rather than this unsanitary condition of affairs should continue, it would be better to abolish towels from the schools altogether, for there is no quicker way to spread disease of various kinds than by compeling children to wipe on filthy towels.

"The unsanitary conditions are so serious that several of the school buildings should not be used as such until extensive changes and repairs are made therein."

MEXICO, City of, 344,377. Bulletin report for month of July: Deaths, 1,487. Annual death rate, 51.81! Prevailing causes: Diarrhoeal diseases, 363; gastro enteritis, 129; tubercular diseases,

43; bronchitis, 72; pneumonia, 81; bronco-pneumonia, 33; typhus ever, 63; smallpox, 55.

TUBERCULOSIS IN ONTARIO.—The "Canadian Practitioner" for August, reviewing the fifteenth annual report of the Ontario Board of Health, 1896, states that "for the first time, an effort has been made to collect reliable and comparative tables showing the deaths from six most malignant of the contagious diseases. Tuberculosis is given the place it deserves, and the most surprising fact presented is that this disease carries off more annually than all others combined."

SCHOOL COMMISSIONERS OPPOSE VACCINATION.—Montreal, Que., Aug. 30.—The Catholic board of school commissioners has refused to comply with the order of the provincial board of health, to refuse entrance to its schools to children without vaccination certificates. The city will station officers at all the Catholic schools to vaccinate the children.

CUBA.—Dr. de Larra y Cerezo publishes, in "La Medicinia Militar Espanola," some statistics of the morbidity and mortality among the troops of the invading army in Cuba. During the month of May there were 38,692 admissions to the general hospitals; of these 523 died, and 33,739 were discharged. In the yellow fever hospitals the admissions for the same time were 814, of whom 226 died and 406 were discharged. In the general hospitals in Havana there were, on the 1st of June, 4,709; there were admitted during the month, 9,931; discharged, 8,798; died, 270; and there remained in hospital, 5,512, on July 1. Of yellow fever the statistics are: Patients in hospital on June 1, 213; admitted during the month, 677; died, 170; and remaining in hospital, 331.

CHOLERA is spreading in Bombay. Many of the English troops stationed there have been attacked.

THE PLAGUE is reported to be increasing again in the district of Poonah.

THE FOURTH CONGRESS FOR THE STUDY OF TUBERCULOSIS is announced, to take place in Paris during the week beginning July 25, 1898.

TRIUMPHS OF HYGIENE IN PORTO RICO.—Dr. Riesco has contributed an interesting article to the Section of Hygiene ("La Revista Medica de Puerto Rico," of the 28th of July) on the progress of public health in that country. He says that a new era has

dawned there after prolonged interruption, in the progress of preventive medicine; the construction of a new hospital and the complete removal of the old walls; and the introduction of an abundant supply of excellent drinking water.

In the political press may be found articles of greatest value from some of the prominent medical practitioners of the capital. who are advocating the necessity of establishing a hospital for the insane, which is certainly very necessary for the island. It is to be earnestly hoped that the provincial deputies will not neglect so necessary an institution, which should be established in the capital of the *pequena antilla.*

The construction of the new military hospital for yellow fever patients will be of great service, for the old building in which patients were treated during epidemics of the vomito had not the necessary accommodations for their proper care.

Modern hygiene, the true medicine of the future, has broken down all opposition to its triumphant progress. The construction of a wooden building for yellow fever patients has been abandoned. after careful consideration, and a substantial building supplied with all the improvements found in the most advanced institutions of the kind will be erected at a cost of about 80,000 pesas. This proposition has been approved by the Governor and will be carried into effect as speedily as possible. The yellow fever cases occurring in the military service will be properly treated.

RESULTS OF SANITATION.—In a recent lecture on what sanitation has done for human life Prof. Brewer of Yale University remarks that no one doubts the fact of human life having been prolonged by the application of science in the last fifty years, though the data in figures can never be obtained. This century came in without a single city in Christendom having a million of inhabitants. Great cities could not endure then. First, the people could not be fed, for most of the population had to be fed, and food produced within twenty miles of the place of consumption, but science has now made it possible to transport food half way round the globe, and has discovered new methods of preservation as well. Nor was city population self-perpetuating—men died off, the death rate was continually high, and from time to time there were the ravages of pestilence and even where there were sewers they were to drain the ground of water rather than to carry away sewage.

THE CONFERENCE OF THE STATE BOARDS OF HEALTH, at its twelfth annual meeting, in Nashville, Tenn., August 18-19, dis-

cussed several important questions, but seems ("Southern Practitioner" for September) to have formulated nothing. Several important propositions were submitted and discussed, but with one exception, no other action was taken upon them. The exception was the adoption of a report by Dr. J. N. Hurty, secretary of the State Board of Health of Indiana, chairman of a committee representing a conference of baggage agents, health officers and funeral directors, held in Cleveland, June 9, 1897, as follows:

Rules and Regulations for the Transportation of Bodies Dead of Dangerous Communicable Diseases.

1. The transportation of bodies dead of smallpox, Asiatic cholera, yellow fever, typhoid fever or bubonic plague is absolutely prohibited.

2. The bodies of those who have died of diphtheria, scarlet fever, glanders, anthrax or leprosy, to be accepted for transportation only when prepared for shipment by being thoroughly disinfected by arterial and cavity injection, disinfecting and stopping of all orifices with absorbent cotton and washing the body with disinfectant.

3. Bodies of those dead of typhoid, puerperal fevers, erysipelas, syphilis or other dangerous, communicable diseases may be prepared for shipment by filling cavities with improved disinfectant, washing the exterior of the body and stopping all orifices with absorbent cotton. In cases of contagion, infectious or communicable diseases, the body must not be accompanied by persons or articles which have been exposed to the infection.

AMERICAN PUBLIC HEALTH ASSOCIATION.—The coming meeting of this Association in Philadelphia, October 26-29, promises to be a memorable one. It will be the silver anniversary of the Association, and the attendance and number of papers read will probably be larger than at any previous meeting. An interesting feature of the meeting will be an exhibit of hygienic and sanitary applications, preparations, etc., including articles of every kind promotive of health. Those who supply hygienic and sanitary appliances and preparations of value and interest should apply to the Chairman of the Committee on Exhibits, Dr. Edward Jackson, 1633 Locust street, Philadelphia.

THE SANITARY INSTITUTE OF GREAT BRITAIN has recently commemorated its twenty-first anniversary by a dinner in London. The Institute now has 2,100 members and associates, and an annual income of £6,000.

BOOK REVIEWS.

TRUE TO THEMSELVES; A PSYCHOLOGICAL STUDY. By ALEX. J. C. SKENE, M. D., LL.D. Cloth, pp. 397. $1.25. F. Tennyson Neely, 114 Fifth avenue, New York; 96 Queen street, London.

Psychology dates from the time of Aristotle, the accredited founder, by his twofold division of the human faculties. But the observers among men even before, as since the time of Aristotle, have always been wont to recognize exceptional phenomena that seemed to indicate the action of the soul independent of the body to which it belonged.

Philosophically considered, all attempts to reconcile such phenomena with material forces have failed; and scarcely less signally, all efforts of physiologists have failed from their standpoint—considering mind, a function of the brain, synonymous with the soul.

Dr. Skene's thorough knowledge of all such efforts to account for the phenomena meant by psychology has not led him to supplement them, pro or con. *His* "Psychological Study" consists in the submission of examples—examples taken from widely different social relations, that show their utter inexplicability from any other point of view than the soul's independence of the body, on occasion, during the lifetime of the individual.

Few writers equal and none we know of excels the author of this book in intensifying the reader's attention to what he has written, because of the inductive force of his style. For while his writings are remarkable for their certitude—based as they are on indubitable facts—they are, nevertheless, an unfolding of scientific progress on the subject in hand, *as far as it has gone*—the end is not yet—insomuch that the reader's thoughts are continually expanding with the display of the subject, while he is ever liable to be shocked at the suddenness of an apparent inopportune stop. He has struck a snag, and if he would reach the heights he must first clear the way—there is an open field beyond. But, alas, when the beyond is in full view, the student of science, if true to himself, is a thousand-fold more athirst than when he first began to drink.

This "Psychological Study" of Dr. Skene's is applied science to a novel subject. In this sense it is a novel—and more: he has taken a novel way of illustrating his subject, with living pictures, "true to themselves," as to human nature. In various vicissitudes,

such illustrations as most physicians have seen more or less of, but have *not looked at them*, hence they have failed to profit by their experience.

But besides much that is of particular interest to physicians—who would be true to themselves—above all, to those who would find out just where they belong, as classified specialists, who should read this book; doctors of divinity also may study a profitable lesson on the marriage question. There is a love story, too; indeed, two of them; illustrating the different obstacles to which all lovers are more or less exposed through diffidence and the ministry—two widely opposing forces—so described as to be of interest to all lovers who would be "true to themselves."

ANNUAL REPORT OF THE SMITHSONIAN INSTITUTION FOR THE YEAR ENDING JUNE 30, 1895, 8vo, pp. 879, opens with the usual official statement of finances, condition of the establishment, with detail of income and expenditures, and the present status of the Institution. The permanent funds of the Institution now amount to $912,000. Besides this amount, the Regents hold sundry sums that have been donated for the investigation of special subjects. Altogether the Institution is in an evidently prosperous condition, propitious for the prosecution of the continued exercise of its functions. It comprehends in the Appendix twenty-nine special reports and papers of scientific subjects, several of which are of interest to sanitarians, notably: "Air and Life," by Dr. Henry de Varigny; "The Atmosphere in Relation to Human Life and Health," by Francis Albert Rollo Russell; "The Air of Towns," by Prof. J. B. Cohen; "The Composition of Expired Air and Its Effects upon Animal Life," by Drs. J. S. Billings, S. Weir Mitchell and D. H. Bergey; "The Evolution of Modern Scientific Laboratories," by Dr. William H. Welch; "Pasteur," by George M. Sternberg, M. D., Surgeon-General U. S. Army. Some of these, in the whole or in abstract, have been published before in the proceedings of scientific societies or periodicals, but they are right worthily associated in this volume with other scientific contributions to scientific progress, more or less related to them.

"The Atmosphere in Relation to Human Life and Health" is a particularly comprehensive paper, occupying 136 pages, in two parts. It gives the chemistry and physics of the atmosphere in all their relations; fog, smoke, gaseous and solid impurities are considered in detail; visible and invisible dust and living germs,

their relative abundance in relation with the numerous local conditions and at different altitudes—sewer air, ground air, micro-organisms in rooms, vapor and organic emanations from living bodies, emanations from the sick, organic vapors: these are some of the significant head-lines of the first part. The second part is headed, "Climate, Air and Health," and considers the relations of particular diseases to different localities and their conditions—ocean atmosphere, the air of high altitudes and of medium elevations. "The Air of Towns" is a like interesting paper, elaborately illustrated, dealing with some of the same subjects as the preceding paper, experimentally. It describes smokeless furnaces and advocates their utility; gives a lucid sketch of Pasteur's work; examples of the number of bacteria found in single grains of street dust and the domestic dust of occupied rooms, respectively; the different proportions of carbonic acid in air under different circumstances. Space will not admit of a more extended notice of this or of the other excellent papers, named by title, under this head. Of some of them we hope for room to give elaborate abstracts hereafter.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, 1897. Pp. 591. Frederic C. Curtis, M. D., Secretary. Albany, N. Y.

A volume of unusual interest to sanitarians, even if it contained nothing else but the symposium on the "Relation of Impure Water to Disease, and the Cure and Prevention of the Latter," comprehending a dozen papers by practical observers on different phases of the subject, and discussion bringing out the conditions under which water is rendered impure; how they may be prevented; the danger of the domestic use of impure water, other than by drinking; water purification; typhoid fever and its treatment. We have already prepared an abstract of the symposium, which we purpose publishing before long.

There are about twenty other papers of interest to all physicians and surgeons engaged in general practice. The volume is admirably gotten up.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY, 1897. Pp. 385. N. E. Worden, M. D., Secretary, Bridgeport, Conn.

This volume comprehends about thirty papers and reports on subjects of more or less practical interest to all physicians, and a dozen of them, at least, of practical importance to sanitarians, not-

ably: "Sterilization of Milk"; "Disinfection," by Dr. Samuel W. Irving; "Etiology of Diarrhoea in Young Children," by O. J. D. Hughes, Ph. D., M. D.; "Dietetic Treatment of Infantile Diarrhoea," by O. T. Osborne, M. D.; "Cows' Milk in Infant Feeding," by Walter G. Murphy, M. D.; "Dr. Edward Jenner and His Great Work," by R. S. Goodwin, M. D.; "Sources of Infection by the Tubercle Bacilli," by F. M. Tukey, M. D.; "Bacteriology of Tuberculosis," by Charles F. Craig, M. D.; "Theories of Immunity; Serum Therapy in Tuberculosis," by Frank M. Tiffany, M. D.; "Early Diagnosis of Tuberculosis," by Charles N. Haskell, M. D.; "Climatological Treatment of Tuberculosis," by George Skiff Ford, M. D.; "Value of Correct Sitting as an Exercise for Invalids," by Frank K. Hallock, M. D.

TWELFTH ANNUAL REPORT OF THE ILLINOIS SOCIETY OF ENGINEERS. C. Knight, Secretary, Pontiac, Ill.

A pamphlet of 150 pages, comprising a dozen special reports and papers on practical subjects, more or less interesting to all engineers and surveyors. The "Report of the Committee on Water-Works and Water Supplies," of Illinois, includes a particularly instructive and useful summary of questions and answers, in tabulated form, giving the data of place, population, construction, private or municipal, quality of water, and source of supply, etc., etc., of every supply in the State.

CONTEMPORARY LITERATURE.

OLD AGE.

In the average statistics of human life it has been found that women live longer than men; the reason for that appears to be simple.

Up to the age of twenty to twenty-five the man is undoubtedly younger and less developed than the woman; but in the next twenty or thirty years of his life the man ages much more rapidly, because, apart from the strain and hardship of a profession, the exposure to unhealthy climates, the disappointments of fortune, he often leads a life of dissipation and excess, which early puts its stamp on his forehead and turns his hair gray before its time. The woman, on the other hand, who has often more than her share of

anxieties has, apart from the many accidents of life, but one serious and inevitable danger, that of the perpetuation of her race, which, safely passed, renovates rather than ages, and increases a woman's chance of longevity.

From the few hints that I have ventured to put together we may deduce, I think, the following conclusions, which I trust may be found of some interest by those who desire to have a general view of the expectation of life, its real duration, and the possible causes of its length and brevity.

1. That, according to the best authorities of the last century, the extreme limit of life might be 125 years under extraordinary and almost abnormal circumstances.

2. That the anticipation of life is roughly five times the time that the organs of the body—not counting the brain, which develops later—require to attain their full and absolute maturity. This of course varies not only in races, but in individuals, some developing early and some much later, even in the same climate and in the same family.

3. That rarely, if ever, is that full duration achieved, owing to disease, food, heredity, bad habits, wear and tear, and many other causes which shorten life.

4. The slower the development the longer may be the duration of life.

5. That all human beings are not born with the capacity for long life even under the most favorable circumstances. As the organism of the human being is more complex than that of the lower animals, so his anticipation of life is far more variable.

6. That those circumstances which conduce to longevity are undoubtedly late development, frugal habits, moderation, exemption from vicissitudes of climate and extreme of heat or cold, from mental worry and agitation, temperance in eating and drinking, with a fair amount of brain work when the brain is ready to undertake it.

We have all heard the well-worn axiom attributed to the Psalmist that the "days of man are threescore and ten"; but in Gen. vi. 3 will be found the following passage: "Yet his days shall be an hundred and twenty years." This passage seems to have been overlooked, as I have rarely seen it quoted, although curiously enough it exactly corresponds to the theory that man should attain five times the period of reaching his maturity.—Lady Glenesk in the "Nineteenth Century" for September.

IMPERFECT FEEDING OF THE CHILD.

That imperfect nutrition is the cause of much of that emotional trangement in childhood which is called irritability, ugliness, ciousness, or something of that sort, has been satisfactorily evinced to the writer as the result of a number of observations hich he has been able to make upon young children. The folwing case is typical of many others: H—— was a well-formed ild at birth, and continued to develop normally during her first e months. Throughout this time she slept very well, and for e most part seemed happy and contented. The constant exression on her face showed healthy feeling, and she rarely made a sturbance. At about the fifth month a change seemed to gradally come over her. She did not sleep so well; the expression on er face showed less happiness and contentment, and by the sixth onth she could be called an irritable and peevish child. She who ad been previously an especially happy child did not now smile ften; and the things which ordinarily attract children of that age emed to be of little moment to her. Some member of the family as now kept busy much of the time endeavoring to soothe her oubled spirit. This state of affairs continued until about the ghth month, when it was decided to make a change in the diet. he was given a food rich in materials to nourish the nervous sysm, and within a week it was observed by all who knew her that ere was a marked improvement in her temperament. After two eeks of proper nourishment she had regained her former restfulss, sleeping peacefully a good portion of the time; and gradually e expressions of irritability and moodiness disappeared. Her ce would now light up as formerly with pleasant smiles whenever ny one she knew was about, and once more she appeared to every ne as a very good-feeling, happy child.—From "When Character Formed," by Prof. M. V. O'Shea, in Appleton's "Popular Scince Monthly" for September.

SOME STATISTICS OF WATERWAYS.

Among the contributed articles in the "American Monthly Reiew of Reviews" for September are sketches of the three memers of the new Nicaragua Canal Commission—Admiral Walker, apt. O. M. Carter, Corps of Engineers, U. S. A., and Prof. ewis M. Haupt. These sketches are illustrated with portraits, nd serve to convey an idea of the peculiar qualifications possessed y these gentlemen for the task to which they have been appointed y President McKinley.

After pointing out that the tonnage "in sight" of the proposed waterway is nearly as great as that carried annually by the Suez Canal, the profits from which are said to pay for its initial cost every five years, Professor Haupt gives some striking statistics of the population and commerce affected and of the result of such expenditures elsewhere, e. g.:

"It is stated by the French economists that the benefits conferred upon that republic by the expenditure of over seven hundred million dollars upon her system of free canals and waterways is equivalent to an annual return of 5 per cent. upon this enormous capital, and it was reported by the United States Senate Committee on Commerce in 1892, that the saving on transportation effected by the St. Mary's Canal was over one hundred million dollars in two years! The same report states 'the total expenditure for water improvements of the lakes has amounted to about thirty million dollars, or approximately to one-fifth of the annual saving in transportation!' "

CROWDED JAVA.

Twenty-four Million People on an Island the Size of New York State.

Eliza Ruhamah Scidmore, author of "Jinricksha Days," writes a paper entitled "Prisoners of State at Boro Boedor," for the September "Century." It is an account of the visit of two American ladies to the vast Buddhist ruins in the middle of Java. Miss Scidmore says:

"Every few miles there were open red-tiled pavilions built over the highways as refuges for man and beast from the scorching sun of one season and the cloud-burst showers of the rainy half of the year. Twice we found busy passers going on in droves beside these rest-houses—picturesque gatherings of men, women and children, and displays of fowls, fruits, nuts, vegetables, grain, sugar, spices, gums and flowers, that tempted one to linger and enjoy, and to photograph every foot of the passer's area. The main road was crowded all the way like a city street, and around these passers the highway hummed with voices.

"One can believe in the density of the population—twenty-four million people on this island of 49,197 square miles, about the size of the State of New York—when he sees the people trooping along these country roads; and he can well understand why every foot of land is cultivated, how even in the benevolent land of the banana every one must produce something; must work or starve. Men

boys toiled to the passers, bent over with the weight of one or monstrous jackfruits or durians on their backs. A woman a baby swinging in the *slandang* over her shoulder had tied kling chickens to the back of her belt, and trudged on comably under her umbrella; and a boy swung a brace of ducks n each end of a shoulder-pole, and trotted gayly to the passer."

THE LESSER MAN" is the title of a remarkably clever contri-ion by Mrs. G. G. Buckler to the "North American Review" September. Mrs. Buckler was born in London. In 1885 she sed the Cambridge senior local examination with great distion, and in 1888 the higher local examination with a like re-. She attended Girton College, 1888-1891, as the holder of a olarship, and on finishing her course there took first class in classical tripos at the Cambridge University examinations. is now a resident of this country. Mrs. Buckler is a niece of f. F. Max Muller, and great-niece of the late Rev. Charles ngsley and of the late Prof. Anthony Froude. Another particuy attractive paper in the same number is on the question, "Are r School Histories Anglophobe?" Professor Smith is of the nion that the influence of American school histories in stimulatinternational ill will has been overstated, their special fault berather want of literary art. What is really needed is a school tory written in fresh, simple and vivid language, truthful, imtial and free from low passions.

Major Arthur Griffiths, Her Majesty's Inspector of Prisons, conutes an interesting paper on "Egyptian Prisons," wherein is ineated the greater security afforded to life and property by a ter administration of justice conferred upon Egypt by the Britprotectorate.—A most appalling state of affairs is disclosed by erusal of Charles Frederick Holder's graphic article on "Chin-Slavery in America," in Chinatown, San Francisco: a veritable anized system. It appears that slavery has existed there for rs. But it is only recently that any action has been taken by courts to prevent it.

THE LIVING AGE seldom fails to gather within its pages the st valuable expression and record of the world's progress and wth along every avenue of thought and activity, and continu- grows in value with the ever steadily increasing stream of perical literature. The titles of a few of the papers contained in its st issues illustrate the freshness, catholicity, spirit and value of

this publication: "England and the European Concert," by James W. Gambier, R. N.; "Woman's Place in the World of Letters," by Alice Stopford Green; "The King of Siam," by B. A. Smith; "Newman and Renan," by Wm. Barry, D. D.; "The Dead-Lock in Austria-Hungary," by Austriacus; "Paris in June, 1871," by A. J. Butler; "Royalties," by F. Max Muller; "The Growth of Caste in the U. S.," by Joseph Edgar Chamberlain; "Recent Science," by Prince P. Krapotkin; "Pascal," by Leslie Stephen; "The Sphinx of Modern London," by F. W. Newland; "The Lesser Elizabethan Lyrists," by Stephen Gwynn; "The Sayings of Jesus;" "Jean Ingelow;" "Mrs. Oliphant;" "A Great Country's Little Wars," with choice selections of fiction and poetry, including Kipling's magnificent "Recessional." Published weekly, at $6.00 a year, by "The Living Age" Co., Boston.

THE AMERICAN JOURNAL OF PHYSIOLOGY.—It affords us pleasure that a new periodical under this name is promised to begin with the new year 1898. The Journal will be edited by a representative committee of the American Physiological Society, and will be under the immediate charge of Dr. W. T. Porter, of the Harvard Medical School. Each volume will contain about 500 pages, divided into parts or numbers, to be issued whenever material is received. It is expected that not more than one volume a year will be printed. $5.00 a year. Subscriptions should be sent to the editor in charge, Dr. W. T. Porter.

THE AMERICAN PEDIATRIC SOCIETY is making a Collective Investigation of Infantile Scurvy as occurring in North America, and earnestly requests the co-operation of physicians, through their sending of reports of cases, whether these have already been published or not. No case will be used in such a way as to interfere with its subsequent publication by the observer. Blanks containing questions to be filled out will be furnished on application to any one of the committee. A final printed report of the investigation will be sent to those furnishing cases to J. P. Crozer Griffith, M. D., Chairman, 123 S. 18th street, Philadelphia.

THE NATIONAL HOSPITAL AND SANITARIUM RECORD is the latest addition to our exchange list. A quarto of twenty-four pages, Vol. I., No. 1, August, is filled with interesting matter "devoted to the Hospital, Sanitarium and Pure Food Interests of the United States." Published monthly. Two dollars a year. "National Hospital and Sanitarium Record," Detroit, Mich.

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PREVENTIVE MEDICINE IN THE CITY OF NEW YORK.*

BY HERMANN M. BIGGS, M. D.,

Pathologist and Director of the Bacteriological Laboratories, Health Department, New York City, and Professor of Therapeutics and Clinical Medicine and Adjunct Professor of the Practice of Medicine, Bellevue Hospital Medical College.

I desire to express my high appreciation of the honor conferred upon me by the invitation of the Council of the British Medical Association to deliver the address on Public Medicine at its annual meeting, and for this I wish to render my grateful acknowledgment.

I interpret the invitation, however, as a tribute to the work of the Health Department of New York City, with which I have had the honor to be connected for many years, and as an expression of the desire of the Council to give recognition to the practical advances made in sanitary science in the greatest city of the New World. I have, therefore, regarded your invitation as a command to select for the subject of this address the consideration of some of the measures which have more particularly distinguished the work of the New York City Health Department, and to describe some of the procedures, followed in the sanitary surveillance of infectious diseases, which have been introduced by it.

I feel a great diffidence in presenting an address dealing with these subjects before the British Medical Association, representing, as it does, the medical profession, and, to a great extent, the health officers of a country which has been so long and justly regarded as

*The Address on Public Medicine, delivered at the Sixty-fifth Annual Meeting of the British Medical Association, Montreal Can., September 3, 1897.

the birthplace and home of sanitary science. It has been the custom of sanitarians of all nations to look to England for guidance and direction in matters connected with the public health, and the low mortality statistics, especially from zymotic diseases, in England testify in no uncertain language to the value of English sanitary methods and the efficiency of their execution. When we remember that never before in the world's history have there been 30,000,000 people living within 50,000 square miles, as is the case in England, and that more than 20,000,000 of this population reside in towns, often crowded, we appreciate more fully the remarkable healthfulness of the England of to-day and the extraordinary success of English sanitation, as of English methods in all the practical affairs of life.

The fact should be strongly emphasized that the advances in preventive medicine in Great Britain, as shown by the mortality tables for nearly half a century, have preceded those in every other country, and I doubt not that the influence of the British Medical Association has been no small factor in contributing to the high standard of the public health. In view of these considerations, it is natural that a foreigner should hesitate to address this Association on questions connected with public medicine.

I must further ask your indulgence in having devoted the greater part of this address to the study and description of procedures and methods, rather than, as is generally the custom, to the consideration of some one of the broader questions in public medicine. This course has been adopted because, in my judgment, such a discussion will be of greater value and interest than the consideration of any general topic, which latter could furnish little specific information as to the conditions and methods of sanitary work in the United States.

It seems necessary, in order that you may have an intelligent conception of the conditions under which sanitary work in the United States is carried on, that I should first point out, in a general way, how they differ from those in Great Britain. It should be noted particularly that in the United States there is no National Board of Health, and there are no national regulations of general application. In each of the several States of the Union the sanitary administration is solely under the control of the State authorities. The State Boards of Health are energetic and progressive in many of the States, but in some there is no sanitary work of importance done.

It necessarily follows that throughout the United States there is a great lack of uniformity in regulations and methods and in the efficiency of their execution. It is hardly possible to make any definite statement as to the condition of preventive medicine generally, for what is true of one State is not true of another. Speaking broadly, in the rural districts and in the towns and smaller cities, especially in the South and West, the sanitary methods are of the crudest type. On the other hand, in many of the large cities, there is found a broad, enlightened and progressive policy and an efficient administration, equal to that presented in any of the great cities of the world.

Instead, therefore, of attempting the consideration of the broader subject of public medicine in the United States, I shall confine myself to a discussion of the conditions and methods of sanitary work in New York City, as these serve as a type of the best of those found in the greater American cities.

The Health Department of New York City is organized under a special act of the Legislature of New York State, and is an entirely independent sanitary organization, not being subject even to the jurisdiction of the State Board of Health.

The Board of Health, or the Health Department, is composed of four members, viz.: The President, who is the chief executive officer; the Commissioner of Health, who must be a physician (these two being appointed by the Mayor of New York City), and two *ex officio* members—the Health officer of the Port of New York (who is a State officer nominated by the Governor), and the President of the Board of Police Commissioners of New York City (the latter being added to bring the Police Department and the Health Department in closer relations to one another. The Commissioner of Health of the Health Board of New York City is *ex officio* a member of the State Board of Health, as is also the Health Officer of the Port of New York; so that two of the members of the Municipal Board are also members of the State Board of Health, but the State Board has no jurisdiction in New York City, and the action of the Municipal Board is absolutely independent.

The Board of Health of New York City has jurisdiction over the whole of New York City as it now exists, with its about 2,000,000 of population, and with the beginning of 1898 a similar Board, increased to five members, will have complete jurisdiction over Greater New York, with a population of about 3,250,000. All of the administrative and executive work of the Department is con-

centrated at the main offices, and is carried on under the immediate direction of the chiefs of the various divisions into which the Department is divided. The act of the Legislature of New York State creating the Department gives to the Board most ample powers, executive, judicial and legislative in character. The funds for the support of the Department are supplied from the general funds of New York City.

Before proceeding to a discussion of the management of infectious diseases in New York, I desire to call especial attention to the fact that all matters connected with the scientific investigation, diagnosis, care or sanitary supervision, in every way, of the infectious diseases are regarded by the Board of Health as properly coming within its province. In the development of the methods now in use, the proposition expressed has furnished the governing principle. I need hardly point out the great difference between this conception of the functions of a Sanitary Board and that usually held.

The duties of sanitary authorities relating to the infectious diseases are generally regarded as limited to the inspection of reported cases of only a few of the infectious diseases, their removal to hospitals when required, and the subsequent proper disinfection of the premises.

In times of emergency, as in the presence of serious epidemics, more comprehensive and stringent measures are considered justifiable; but it has not been generally regarded as necessary or desirable that municipal sanitary authorities should furnish opportunities for or assistance in the diagnosis of infectious diseases, should conduct experimental investigations into their causes, should assist in the treatment in any way of cases outside the hospitals, or otherwise concern themselves with these matters. It has seemed to us in New York City, however, that everything connected with the infectious diseases in every form came properly within the scope of the Department's work.

The first important departure in New York City, from the older methods, was made in 1892 by the establishment of a bacteriological laboratory. This was, I believe, the first bacteriological laboratory ever established under municipal control. It was designed originally to afford facilities for the bacteriological diagnosis of Asiatic cholera, and for the investigation of questions relating to disinfection and disinfectants. A few months after the opening of the laboratory, the scope of its work was broadened and facilities

for the bacteriological diagnosis of diphtheria were offered to the physicians of New York City free of charge. The necessity for making repeated examinations during the course of this disease soon became evident, and such changes were made by the health authorities in the methods of dealing with diphtheria as were suggested by the earlier experimental observations.

The investigations of the New York City Health Department relating to diphtheria laid the foundations of municipal bacteriological laboratories and made them necessary to the proper conduct of sanitary work.

The work on diphtheria was soon followed by the perfecting of arrangements for the free bacteriological examination of sputum for the diagnosis of cases of suspected tuberculosis occurring among residents of New York City.

In October, 1894, investigations in connection with the production of diphtheria antitoxin were begun, and in December of that year the municipal authorities made a special annual appropriation (antitoxin fund) of $30,500 for the prosecution of this work. The Health Department commenced the use of the antitoxin produced in its own laboratories on January 1, 1895. The plan as now developed includes:

First—The furnishing of free supplies of diphtheria antitoxin to all public institutions in New York City.

Second—The furnishing of free supplies of diphtheria antitoxin to private physicians for use among persons too poor to pay for the remedy; the only condition being that reports of the cases treated be forwarded to the Health Department on their completion.

Third—The free administration of diphtheria antitoxin on the request of the attending physician to any resident of New York City by a specially detailed staff of medical inspectors.

The sale of the surplus product of diphtheria antitoxin was authorized by a special act of the New York State Legislature in 1895, and the funds thus derived, according to the provisions of this act, are devoted solely to "the production and use of diphtheria antitoxin or other antitoxins." The remedy is on sale in over 100 pharmacies in the city, to which it is consigned, the price being fixed by the Health Department in all cases, and ten per cent. on the sales is allowed to the pharmacies as commission.

The special antitoxin fund made possible the establishment of a hospital and research bacteriological laboratory devoted to the pro-

duction of of diphtheria antitoxin and other bacteriological products and to general experimental investigations in relation to the infectious diseases. The work of this laboratory now includes the production of tetanus and streptococcus antitoxins, mallein and tuberculin (used by the Department in the diagnosis respectively of glanders and tuberculosis in animals) and numerous experimental investigations regarding the infectious diseases, especially diphtheria, typhoid fever, tuberculosis and smallpox.

In October, 1896, arrangements were completed for placing at the command of the physicians of New York City Widal's test for the diagnosis of typhoid fever, largely after the method of Wyatt Johnson, of Montreal, and recently arrangements have also been made for the administration of Pasteur's treatment for the prevention of rabies.

A special laboratory and stable are devoted to the production of bovine vaccine virus, and this is freely distributed and vaccination is performed free of charge by the medical officers of the Department. Special investigations undertaken in this laboratory have resulted in the production of a glycerinated vaccine pulp of great activity and durability. This has entirely displaced the virus prepared by drying on quills or ivory points generally employed.

The work connected with disinfection was formerly in charge of the Director of the Bacteriological Laboratories, and the methods employed are still determined in the laboratories, but the details of execution are now entrusted to the Chief Inspector of Contagious Diseases.

A better idea, perhaps, of the extent of the work performed in the laboratories of the Health Department of New York City may be obtained from the following statistical statement of some of the routine work:

During the year 1896, 25,049 cultures were examined for diphtheria bacilli; 1,856 specimens of sputum from cases of suspected tuberculosis were examined for tubercle bacilli; 16,796 vials of diphtheria antitoxin were issued; 918 cases of diphtheria were treated in their homes by the medical *attaches* of the laboratory and 1,214 persons were immunized.

The scientific staff of the bacteriological and vaccine laboratories now includes twenty-five physicians, one chemist and two veterinarians, in addition to clerical and laboratory assistants and attendants.

Every case of contagious disease reported to the Department is regularly inspected by the Medical Inspector assigned to the district in which it occurs. When consent can be obtained, such cases are removed to the department hospitals, and when necessary the removal to the hospitals is enforced. A comparatively small proportion of the total cases, however, are actually treated in the hospitals for contagious diseases. After completion of the illness, or transfer of the patient, thorough disinfection is performed in the apartment, and all infected materials are removed to the disinfection station for destruction, or for disinfection by steam. After treatment they are returned to the owner, no charge being made for the services. Disinfection is compulsory in every case.

The inspection work of the Health Department is carried on by a number of different corps of inspectors attached to the various divisions of the Department. These inspectors are in part medical men, and in part they are non-medical men, who have had special training in the work to which they are detailed. The medical corps include the district medical inspectors; the district and special vaccinators; the inspectors for the administration of diphtheria antitoxin; the diagnosticians; the summer corps of inspectors; the medical inspectors of schools; the veterinary inspectors, and several special inspectors of disinfection of lodging houses and public institutions. These various corps, with the exception of the summer corps and the school inspectors, are permanent and are on duty throughout the year. The school inspectors are on duty only through the school year, and the work of the summer corps is limited to July and August. There are also a number of corps of sanitary and food inspectors (not necessarily medical men) and the disinfection corps. These include the inspectors of plumbing and ventilation; the sanitary police; the inspectors of offensive trades; the inspectors of meat, fish, milk and food, and the inspectors of mercantile establishments.

The functions of most of these different corps are, for our purpose, sufficiently indicated by the name. It may be here added, however, that, under the law creating the corps of inspectors of mercantile establishments, definite provisions are made as to employment of women and children in such establishments, and as to the time, nature and condition of such employment.

It should, perhaps, also be stated that the function of the diagnosticians, two of whom are always on duty day and night, is to give expert assistance in the *clinical* diagnosis of contagious dis-

eases. It is a part of their duty to see every case of contagious disease before its admission to the Department hospitals.

The veterinary inspectors have supervision of the application of the tuberculin test for the diagnosis of tuberculosis in cattle, and the diagnosis of other infectious diseases of cattle and horses.

I desire now to present somewhat in detail the methods of procedure in relation to two diseases, viz., diphtheria and tuberculosis, as in these diseases the methods have been developed to an unusual extent in New York.

Knowledge of the existence of cases of diphtheria reaches the Department either by a direct report of the case by the attending physician, or through the forwarding of a culture to the laboratory for bacteriological examination, when the case is of doubtful character. If on examination of the culture the Loeffler bacilli are found, the case is reported to the Division of Contagious Diseases from the laboratories at the same time that a report is forwarded to the attending physician. In both instances the cases are immediately referred to the Medical Inspector connected with the Division of Contagious Diseases assigned to the district in which the case occurred. If the person lives in a tenement house, lodging house, boarding house, or hotel, and a culture has not been previously made by the attending physician, the Inspector makes, in each instance, a culture to confirm the diagnosis. The subsequent action of the Department depends upon the result of this culture. If diphtheria bacilli are found the case is treated as one of diphtheria; if they are absent, the subsequent treatment depends on the special conditions existing. In every instance in which the case is proven to be diphtheria, at the end of ten days a secondary culture is made by the attending physician or the District Medical Inspector, to determine whether the diphtheria bacilli are still present in the throat, and subsequent cultures are made at short intervals until the examinations show that the organisms are no longer present. The case is then referred for disinfection, a detailed statement being left at the house by the Medical Inspector in charge, to guide the disinfectors as to the course which shall be followed.

Every case of diphtheria which comes to the knowledge of the Department is recorded in a card index, according to the number of the house and the street in which it occurs. In this index envelopes are used in place of cards, and in each envelope, representing always one case, are placed all the data relating to the first and subsequent cultures and results, and as each case is recorded it is

: the same time placed on a sectional map of New York City, rawn to scale, showing every house lot in the city. This platting done by conventional signs, so that it is possible at a glance to etermine the grouping and distribution of cases in different parts f the city, the number occurring in any given house in the city uring the last four years in which this method has been in use, nd the data when reported. It is also possible in a moment, by eference to the yearly card index, to find all the information in re- ation to each case which the Department possesses.

A special corps of inspectors is assigned to the administration of iphtheria antitoxin, and on request, one of these inspectors will isit a person suffering from diphtheria in any part of the city, day or night, and administer diphtheria antitoxin, under the supervision of the attending physician. When the patients are too poor to ave an attending physician, the inspectors will supervise their re- noval to the hospitals. These inspectors are also prepared, at the equest of the attending physician, to perform intubation in lar- ngeal diphtheria. It is the usual course, when antitoxin is admin- tered by an inspector, to immunize all members of the family ho have been exposed to the disease. Diphtheria antitoxin has so been largely employed for the immunization of the inmates of ublic institutions, especially children, when diphtheria has ap- ared. This is the ordinary routine, and in every instance during e last two and a half years it has been possible to to quickly stamp t diphtheria in institutions by this process of immunization.

As already stated, diphtheria antitoxin is furnished on request ee of charge to all public institutions, and may be obtained by ysicians at any of the 100 depots where it is on sale, free of arge, for administration to persons who are too poor to pay for e remedy.

In connection with the study of diphtheria, experimental in- stigations are constantly being carried on to determine the viru- nce of the diphtheria bacilli found in healthy throats, in simple tarrhal angina and follicular tonsilitis, and regarding the various atters which relate to the bacteriological study of this disease.

The attitude assumed by the Health Department of New York ity toward pulmonary tuberculosis, and the measures adopted for s prevention, constitute, in my opinion, a most important feature f its work. No more striking example of the influence of inher- ed and transmitted beliefs and prejudices can be found than is fforded by the exhibition of hesitation and reluctance on the part

of the proper authorities to assume the sanitary supervision of the tubercular diseases. It is now universally admitted that tuberculosis is infectious and communicable, and the most fatal disease to which the human race is subject; yet as a rule no effective measures, or no measures at all, have been adopted by sanitary authorities with relation to it. Nevertheless, we believe it more easily may be controlled than any other of the principal infectious diseases with which we have to deal, and that it is of as great importance—judged by the deaths it causes—as all the others together. The full courage of scientific conviction seems to have been generally lacking among public officers in dealing with this disease.

The Health Board of New York City first began an educational campaign in relation to the causation and prevention of pulmonary tuberculosis in 1889. In that year a communication on this subject, presented by the writer and the associated Consulting Pathologists of the Department, was widely published, and leaflets, based on it, giving the essential facts as to the nature of this disease, were freely distributed. No further action was taken at that time, as investigation showed that the medical profession and the public were not then prepared for more extended measures.

In December, 1893, the attention of the Department was again called to the subject by the writer, and it was determined to institute more comprehensive measures for the prevention at once of this disease. The measures then adopted required the notification of all cases of pulmonary tuberculosis occurring in public institutions, and requested reports of cases occurring in the practice of private physicians. They also included arrangements for the bacteriological examination of sputum, to assist in the early diagnosis of this disease; the inspection of all reported cases in tenement houses, lodging houses, hotels and boarding houses, and the instruction of the patients and their families as to the nature of the disease and the means to be taken for its prevention; the inspection of the premises in all instances where deaths were reported as due to tuberculosis, and the issuing of orders, when it was deemed necessary, upon the owners of apartments which had been occupied by consumptives and vacated by death or removal, requiring that such apartments be thoroughly renovated, by cleansing and by painting, papering or kalsomining, before they were again occupied by other persons; and, finally, the education of the public, by wider and more comprehensive methods, as to the nature of this disease.

Placards were attached to the doors to prevent the re-occupation f apartments which had been vacated by death or removal before ıe orders requiring renovation had been complied with.

Under the resolutions by virtue of which these measures were nforced, 4,166 cases of tuberculosis were reported in 1894; 5,818 ı 1895, and 8,334 in 1896. So far as was possible all of these ases, except those in private houses, were visited or the premises here they had lived were inspected, and, in addition, the premises ccupied by persons dying from tuberculosis (numbering each year early 6,000) were inspected and such action taken as was consid-red possible and desirable. Altogether the premises and cases hus coming under observation during these three years numbered nore than 35,000.

These facts convey some idea of the enormous sanitary import-ınce of the subject. It is conservatively estimated that there are at least 20,000 cases of well-developed and recognized pulmonary tuberculosis now in New York City, and an additional large num-ber of obscure and incipient forms of the disease. A very large proportion of the former cases constitute more or less dangerous centers of infection, the degree of danger depending in each in-stance upon the intelligence and care which is exercised in the de-truction of the expectoration. All the suffering and death conse-luent upon the prevalence of this disease, in view of modern scien-ific knowledge, is largely preventable by the careful observation of imple, well understood and easily applied measures of cleanliness, isinfection and isolation.

In the beginning of 1897 the Health Board further adopted some ecommendations made jointly by Dr. T. Mitchell Prudden, Con-ılting Bacteriologist to the Health Department, and the writer, hich advised that pulmonary tuberculosis be declared to be an infectious and communicable disease, dangerous to the public ealth," and which required "the notification of all cases occurring ı the city," in the same way as is required in regard to typhoid ever, diphtheria and other similar diseases. Tuberculosis, how-ver, in accordance with the special section of the Sanitary Code, nacted to provide for these measures, is distinctly separated from he eruptive diseases—is not classed with them as a contagious dis-ase, but is referred to as "an infectious and communicable dis-ase." It has always appeared to the Health Board exceedingly lesirable that a broad distinction should exist in the public mind

between this disease and those diseases which are more properly classed as contagious.

In the treatment of apartments, which have been occupied by tubercular patients and vacated by death or removal, renovation has been and is ordered, rather than disinfection attempted, because the Health Board has always felt that disinfection for tuberculosis in the poorest tenement houses was too difficult to be satisfactorily performed, and has considered renovation as certainly efficient. In the thousands of orders requiring the renovation of premises, which have been issued under the resolution referred to upon the owners of real property during the last four years, little or no difficulty has been experienced in enforcing compliance, and rarely has there been serious objection.

Public institutions, hospitals, asylums, homes, etc., are now not only required to report the name, last address, sex, age and occupation of every case of tuberculosis coming under observation within one week of such time, but they are further required to notify the Department of the discharge or transfer of such patients. The purpose of this procedure is to keep under more or less constant supervision those cases of pulmonary tuberculosis which occur among the poorest classes of the population; in other words, those which are most likely to be dangerous sources of infection to others. Unfortunately, at the present time there are no hospitals, directly under the control of the Health Department, for the care or isolation of cases of pulmonary tuberculosis; but it is hoped that such hospitals may be soon provided.

The best medical opinion forbids that persons suffering from pulmonary tuberculosis be treated in association with other classes of cases in the general medical wards of general hospitals. This opinion is based on the daily observations of dangers incident thereto, and it has very properly resulted in the exclusion to a large extent of persons suffering from this disease from many of the general hospitals to which they were formerly admitted.

A large experience has also shown that in institutions devoted solely to the care of consumptives the general welfare of the patients is more easily fostered, the risks of fresh infection more certainly diminished, and the chances for recovery more surely enhanced than in general hospitals in which all classes of cases are received.

From the beginning of this work the officials of the Health Department of New York City have encountered, in the lack of

oper facilities for the care of consumptives, a great obstacle to actical success, and I am convinced that the grave responsibilities ich rest upon sanitary authorities generally in this matter cannot properly discharged without the establishment, under their dir- t control, of additional special hospitals for the care and treat- ent of this disease. No week passes in which the officers detailed this work in New York do not encounter many instances in ich the members of many households, numerous inmates of owded tenement houses, employees in dusty and unventilated orkshops, and many others, are dangerously exposed to infection om victims of this disease, who cannot gain admittance to the er-crowded public institutions, or who reject all proffered assist- ice and instruction, and, from ignorance, indifference, or inability rough weakness due to the disease, scatter infectious material oadcast, thus diminishing their own chances for recovery and nperiling the health and safety of others. In such cases sanitary iggestions are futile, and removal to a hospital constitutes the nly effective action. I am convinced that no factor is so potent o-day in perpetuating the ominous death list from pulmonary iberculosis as the lack of proper facilities for the adequate care of ie poor stricken with this malady.

The measures designed for the prevention of tuberculosis, prop- rly include not only those which relate to the transmission of the isease from human beings to each other, but also those which re- ate to the transmission of the disease from affected animals, espe- ially the bovine species, to human beings, through the meat and nilk used as food. The Health Department of New York City, while feeling strongly that the most important source of infection s through the sputum of consumptives, has yet elaborated with great care methods for protecting the public, so far as lies within ts power, from infection by the meat and milk from tubercular nimals. In order that a more effective control of the milk supply hould be possible, an ordinance was passed in 1895 forbidding ie sale of milk within the city without a permit from the Health Department, and requiring that all wagons used for transportation r delivery of milk should othewise have wagon permits. Before iese permits are issued, the holder of the permit must furnish in- ormation as to the source from which the milk is obtained, the umber of animals, the character of the food supply, and the sani- ary conditions surrounding the dairy. Special regulations have been established with regard to the sale of milk, and permits may

be revoked at any time by the Health Board, where evidence exists that the regulations have not been strictly complied with. All milch cows in New York City (about 3,000 in number), are now being subjected to the tuberculin test, under the supervision of the Health Department, and animals found to be diseased are killed. It is proposed, as soon as this work is completed in New York City, to require similar tests to be applied to all cows whose milk is sent to New York City. There also exists a careful inspection of animals slaughtered for food, and of all meat sent into the city, and the carcasses of those found to be tubercular are destroyed.

Most beneficial effects have already resulted from the various measures instituted for the prevention of this terrible disease. Not only has there been a very material decline in the number of deaths occurring from it, but there has been a most gratifying increase of knowledge and intelligence as to its nature among the poorest class of the population. The inspectors detailed for this work report that, on their first inspection, in nearly one-half of the cases occurring in many parts of the tenement house districts of the city, it is found that more or less efficient precautions are being taken for its prevention. Such precautions are the use of rags to receive the sputum, which are later burned, instead of handkerchiefs; the use of cups containing water or a disinfecting solution; the separation of the clothing of the patient from that belonging to others, and similar measures.

This increase of intelligence, and the precautions resulting from it, afford the greatest promise for the future, of a persistent and still more rapid decline in the frightful morbility and mortality caused by the tubercular diseases.

Investigations made by the Department, showing that the dust in the street cars and various public places is often infectious, led to the enactment of an amendment to the Sanitary Code prohibiting the spitting on the floors of street cars, ferry boats and other public conveyances, and requiring that all companies should post in the cars, boats, etc., printed notices forbidding this. This regulation is very difficult of enforcement; but, while the results have been by no means entirely satisfactory, there has yet been a definite improvement in the existing conditions.

The method employed for recording and plotting cases of diphtheria is also used for cases of tuberculosis. I have had prepared transcripts from the maps on which are platted the cases of diphtheria and tuberculosis, to show the distribution of these cases in

certain wards of the city. These wards have been selected in each instance because of the large number of cases of the respective diseases occurring in them.

Maps 1 and 2 show respectively the Fourth and Sixth Wards, with the distribution of reported cases and deaths from tuberculosis in these wards during three years. The cases and deaths in 1894 are platted with a circle, cases and deaths in 1895 with a triangle, and the cases and deaths in 1896 with a dagger. The dwelling houses in the maps have been colored so as to put them in contrast with buildings not occupied as dwelling houses. Thus the dwellings which had one or more cases of tuberculosis during this period are colored pink, and those free from tuberculosis during these years are colored blue. The plots which are uncolored are not dwelling houses, but occupied as business buildings, warehouses, etc.

These maps argue more forcibly for the infectious and communicable character of this disease than could any words. It should be said, however, that in some instances, where a large number of cases have occurred in one house during these years, the house had been occupied as a Chinese lodging house. This is especially true of several of the houses on Pell and Mott streets.

Maps 3 and 4 show the distribution of cases of diphtheria for the same period in the Tenth and Thirteenth Wards. These maps, as has been said, are simply transcripts, reduced in size, from the maps on which are platted, day by day, the reported cases and deaths from these diseases throughout the city.

TABLE I.

Analysis of Distribution of Reported Cases and Deaths from Tuberculosis in Wards IV. and VI.

Years 1894, 1895, 1896, to March, 1897.

Ward IV.

According to the census of 1896, there were 663 inhabited houses in Ward Four, with a population of 18,323, or an average number of 27.6 persons per house.

No. of houses in which cases occurred	248
" cases in 1894	173
" " 1895	161
" " 1896-97	207
Total number of cases in three years	541
Average number of cases per infected house	2.81

Percentage of houses infected.....37.3
Average number of cases per house in ward.....0.81

Cases per 1,000 population in 1894..... 9.4
" " " 1895 ..... 8.7
" " " 1896-97 .....11.2
Total cases per 1,000 population in three years...29.3

Table II.

Ward IV.

Houses showing three or more cases of tuberculosis.

No. of houses in which three or more cases occurred. 70
" cases in 1894..... 88
" " 1895 95
" " 1896-97 119
Total cases in these houses in three years..... 302
Average number of cases per house..... 4.3

Comparing these figures with those obtained for the whole ward:

Total number of infected houses in Ward Four..... 248
Number of houses in which 3 or more cases occurred 70
Percentage on total infected houses.....28.2

Total number of cases in Ward..... 541
Cases occurring in 28.2 p. c. of the houses infected.. 302
Percentage of total cases.....55.8

Total number of inhabited houses..... 663
No. of houses in which 55.8 p. c. of cases occurred.. 70
Percentage in total houses..... 10.5

It is thus seen that of the infected houses 28.2 per cent. contai 55.8 per cent. of the cases, and these occurred in only 10½ per c of all the houses in Ward IV.

Table III.

Ward VI.

According to census of 1896, there were 630 inhabited houses Ward Six, with a population of 22,897.

No. of houses in which cases occurred..... 239
" cases in 1894..... 157
" " 1895 127
" " 1896-97 191
Total number of cases in three years..... 465
Average number of cases per house.....1.94
Total number of dwellings in Ward..... 630
Number of houses infected with tuberculosis..... 239
Percentage of infected houses.....37.9

Average number of cases per house in Ward..... 0.72
Cases per 1,000 population in 1894..... 6.8
" " " 1895 ..... 5.5
" " " 1896-97 .... 8.2
Total cases per 1,000 population in three years.. 20.5

TABLE IV.

Ward VI.

Houses showing three or more cases each of tuberculosis.

No. of houses in which three or more cases occurred. 45
" cases in 1894..... 72
" " 1895 56
" " 1896-97 78
Total number of cases in three years..... 206
erage number of cases per house..... 4.5
Comparing these with the figures obtained for the whole Ward:
Total number of infected houses..... 239
No. of houses in which three or more cases occurred. 45
Percentage of total infected houses.....18.9

Total number of cases in Ward..... 465
Cases occurring in 18.9 p. c. of the houses infected.. 206
Percentage of cases in same.....44.3

Total number of inhabited houses..... 630
No. of houses in which 44.3 p. c. of cases occurred.. 45
Percentage in total houses..... 7.1

Thus, 44.3 per cent. of the cases occurred in 18.9 per cent of the fected houses, and these constituted only 7.1 per cent. of all the uses in Ward Six.

I desire now to refer briefly to the system of medical school inspection, instituted by the Health Department during the last year, which has given thus far most satisfactory results, and which promises greater good in the future.

Early in 1897, under the authority of a special resolution of the Board of Estimate, 150 Medical School Inspectors were appointed by the Health Board, after Civil Service examination. The duties of these inspectors consist in the examination daily, at the opening of the primary and grammar departments of each of the public schools and of the parochial and industrial schools, of all the children who are set apart by the respective class-room teachers as not appearing to be entirely well. These children are examined in each school by the Inspector detailed to the school, and are either excluded from the school or returned to the class-room, depending on the result of the examination. Every pupil found to be suffering from any form of general contagious disease, or any contagious disease of the eye or parasitic disease of the skin, is sent home, with a written statement to the parents of the cause for the action, and in case of the eruptive diseases and diphtheria, reports are immediately forwarded to the Chief Inspector of Contagious Diseases, and by him referred to the various District Medical Inspectors for inspection and supervision.

The children excluded because they were thought to be suffering from measles, scerlet fever, diphtheria and chickenpox, were afterwards seen by the Medical Inspectors, and in the majority of cases the original diagnosis was confirmed.

The educational work of the Health Department is, I believe, of very great importance. It has been the custom of the Department for some years past to issue from time to time circulars of information on various topics, and especially with relation to the infectious diseases, their diagnosis, treatment or management. Some of these circulars are popular in character, very large editions being published, 50,000 or more at a time, and are designed for general distribution, particularly among the tenement house population.

Examples of this class are the following: "Iinformation for Consumptives and their Families," "Infant Feeding," "Methods of Transmission of Contagious Diseases," and numerous others on similar topics. Circulars of information are also issued which are designed for distribution among the medical profession. These relate to the work of the Health Department in connection with infectious diseases, or to the bacteriological products of the labora-

tories. Many such circulars have been issued on various topics connected with diphtheria, such as "Bacteriological Examinations for the Diagnosis of Diphtheria," "Relation of Membraneous Croup to Diphtheria," "Diphtheria Antitoxin," "Persistence of Diphtheria Bacilli in the Throat During Convalescence from Diphtheria," "Occurrence of Diphtheria Bacilli in Healthy Throats and in Catarrhal Angina," etc. Other circulars of information have been issued on "The Importance of Bacteriological Examinations in the Early Diagnosis of Pulmonary Tuberculosis," "The Nature and Causation of Pulmonary Tuberculosis," "The Measures Adopted by the Board of Health for the Prevention and Restriction of Pulmonary Tuberculosis"; and on the use of "Mallein," "Tuberculin," "Tetanus Antitoxin," "Glycerinated Bovine Vaccine Virus," etc.

During three months (65 school days), in which this system has been in operation, there have been examined 63,812 children, who had been set aside by the teachers as not appearing entirely well, of which number 4,183 were excluded for the following reasons:

Measles	88
Diphtheria	167
Scarlet fever	32
Croup	11
Whooping cough	26
Mumps	117
Contagious eye diseases	702
Parasitic diseases of head	2,627
Parisitic diseases of body	108
Chickenpox	130
Skin diseases	175
	4,183

As these various circulars are published by the Health Department, copies of them are sent to the medical journals published in New York City and to the daily press. Thus they gain at once a wide circulation. In addition, some one or more of these circulars is included in each report of the results of the bacteriological examinations in diphtheria and tuberculosis, as they are sent from the laboratories. As more than one hundred reports daily are sent out, a large circulation is again attained among physicians in this manner. In some instances, circulars considered to be of unusual importance have been delivered by messenger to the house of every physician in New York City.

Aside from the circulars described, numerous scientific bulletins have been issued from time to time from the bacteriological laboratories, detailing the results of original investigations in connection with infectious diseases, and these bulletins are widely distributed among the profession of New York City.

I do not believe that the importance of this educational work can be over-estimated. Its value is incalculable in widely disseminating proper and scientific information with regard to the results of the latest studies in infectious diseases, and there have been constantly exhibited in New York the most gratifying indications of the influence of the information thus distributed, on both the general public and the medical profession.

More than this, the circulars keep constantly before the medical profession and the laity the work, the duties and the functions of the Health Department, as related to the people and the profession.

It has been frequently urged, especially in the earlier work of the New York City Health Department, that the methods proposed were theoretically commendable enough, but that they were impracticable. This criticism has been often made, particularly in Europe. The best reply to this is, that the results have shown that they are not impracticable. What has been described is not something that it is proposed to do, but it is a statement of what has been and is being done, and this work, as briefly outlined in some of its phases, is to be considered as only introductory.

It is the purpose of the Health Board to establish a supervision of all infectious diseases along the lines which have been thus far developed in relation to tuberculosis and diphtheria, as rapidly as the scientific knowledge at command will make such a course possible.

The final test of the efficiency of any scheme of sanitary control and of the healthfulness of any community or locality is found in the morbility and mortality statistics, considered in relation to the causes of sickness and death. It is not simply the number of deaths or cases of sickness in proportion to the population, but also the nature of the diseases which cause morbility and mortality.

In comparing the statistics for different localities, however, the special factors relating to each locality must be taken into consideration; for a death rate which would indicate unusually favorable conditions in a large city, might show far from favorable conditions in a rural population. The density of population has generally a very definite relation to the mortality.

Dr. Farr attempted to deduce a formula by which the mortality any locality could be translated into that of another having a different degree of aggregation of the population. He showed that hen the population has reached a certain density, there is a conant and uniform increase in the death rate with any further inease in its density. For example, in fifty districts in Great Brit-n, with a population of 2,500,000 and with 650 persons to a square ile, the death rate was 20.5 per thousand. In those districts which ontained 2,100 persons to a square mile, and a population of 2,-0,000, the death rate had increased to 24.4; with a population of 800 to a square mile the death rate had further increased to 25.5, id with a population of 6,144 persons to a square mile, the death ite was 30.2.

The local variation in mortality with the density of population as not been constant in New York City, for in some of the wards, here the density of the population is greatest the mortality has een below the average, and in other wards, with a relatively scarce opulation, the mortality has been extremely high. Other factors ave exerted an even greater influence on local variations of mor-lity than density. The highest death rates have been found in ie lower and oldest parts of the city, where the buildings are old id the sanitary conditions in many respects unfavorable.

The nationality of the population has a definite influence, as has :en shown in an analysis of the death rates in different parts of ew York City made by Dr. Roger S. Tracy, Registrar of Vital :atistics. Those districts with the densest population, where the .tes are comparatively low, are largely inhabited by Russian and olish Jews, who are a hardy race and proverbially long lived. On :e other hand, the wards having the highest death rates, or nearly :e highest, are occupied largely by Italians, among whom, in the nited States at least, the death rate is exceedingly high.

The sanitary problems presented in a city like New York are usually difficult, on account of the diversity and cosmopolitan haracter of the population. The presence of large numbers of reign-born inhabitants of many different nationalities, grouped iten in restricted localities and retaining their native customs and iodes of life, and the great density of the population, constitute .ctors which largely complicate the situation.

The physical conformation of Manhattan Island is, in some re-pects, exceedingly unfavorable. The island is long and very nar-ow, and as a result certain parts of the city, and in fact the island as

a whole, is over-crowded. Fully three-fourths of the population live in tenement houses, which are five, six or more stories in height, and contain from two to four or more families on each floor. Each house is placed on a lot not more than 25 by 100 feet, and frequently twenty families, numbering more than 100 persons, live on an area of this size.

The average density of population in New York City below the Harlem River, *i. e.*, on Manhattan Island, is greater than that of any of the other great cities of the world. The only localities approaching in density of population certain wards in New York are a small area in Paris, where the population is 430 to the acre; one district in Prague, where the population is 485 to the acre; the Whitechapel district in London, which has a population of about 300 to the acre in Spitalfields, Mile End and Newtown, and 365 in Bethnel Green. In New York City, Sanitary District A of Ward Eleven has a population of more than 800 to the acre; Ward Ten, over 640 to the acre; Ward Thirteen, 540; Ward Seventeen, 430; Ward Seven, 360; and Ward Fourteen, 295.

These facts must be kept in mind in considering the mortality statistics of New York, as compared with those of the large cities of Great Britain and the Continent. With these before us, the diminution in the death rates, and the present death rate, are most significant.

A comparison of the mean total death rate for decennial periods in New York City since 1834 shows that there was an increase during the first three periods ending in 1863, and that since that date there has been a continuous and very heavy decline in the rate, especially marked in the most recent years. The mortality in New York arose to such a high point that the inhabitants became alarmed, and in 1866 the Health Department as now constituted was organized. In the decennial period ending in 1843 the mean death rate was 28.03; for the period ending 1853 it had risen to 33.81; during the next period, ending in 1863, it was 33.94. Since that time it has declined to 31.11 for the decennial period ending in 1873; to 26.87 for the period ending in 1883; to 25.78 for the period ending in 1893, while in the year 1894 it was 22.76; in 1895, 23.10; in 1896, 21.54, and for the first half of 1897, 19.60. The population meanwhile has increased from 312,090 in 1840 to an estimated population of 1,990,000 on July 1, 1897.

The mortality rate is normally higher for the first half of the year than the second half, and it is therefore probable that the rate for

1897 will be a fraction over 19, or a diminution of 25 per cent. on the death rate for the decennial period ending in 1893.

The percentage of mortality occurring in children under five is always high, and has been long regarded as an excellent index of existing sanitary conditions. The injurious effects of unsanitary conditions and surroundings always fall heaviest upon the youngest element of the population.

TABLE V.

New York City.

Annual death rate for all causes, and for certain diseases, 1886 to 1896, inclusive, and January-July, 1897:

YEAR.	All causes.	Diphtheria and Croup.	Phthisis.	All Tubercular diseases.	Measles.	Smallpox.	Scarlet Fever.	Typhoid Fever.	Diarrhœal diseases of children under five years.	Diphtheria and Croup, all Tubercular diseases, Measles, Smallpox, Scarlet Fever, Typhoid Fever, and Diarrhœal diseases of children under five years.
1886..	25.99	1.87	3.79	4.42	0.46	0.022	0.26	0.23	2.08	9.34
1887..	26.32	2.06	3.56	4.06	0.52	0.067	0.40	0.22	2.20	9.53
1888..	26.39	1.68	3.46	3.99	0.39	0.050	0.89	0.24	2.00	9.24
1889..	25.32	1.46	3.31	3.86	0.30	0.0006	0.79	0.25	2.00	8.66
1890..	24.87	1.11	3.41	3.97	0.45	0.001	0.25	0.22	1.86	7.86
1891..	26.31	1.19	3.11	3.56	0.40	0.001	0.74	0.23	1.92	8.04
1892..	25.95	1.23	2.95	3.55	0.51	0.050	0.57	0.23	1.85	7.99
1893..	25.30	1.45	2.91	3.51	0.22	0.060	0.31	0.22	1.65	7.42
1894..	22.76	1.59	2.57	3.46	0.32	0.085	0.30	0.18	1.50	7.14
1895..	23.11	1.05	2.77	3.34	0.42	0.005	0.25	0.17	1.51	6.75
1896..	21.52	0.91	2.58	3.06	0.37	0.0005	0.21	0.15	1.32	6.02
Jan.-July.										
1897..	19.60	...	2.44	2.97	0.20	0.021	0.30	...	...	...

New York City.

Annual death rate for all causes and for certain diseases, 1886 to 1896, inclusive, and January-July, 1897:

TABLE VI.

	All causes.	Over 5 years of age.	*Under 5 years of age.	‖ Miasmatic, Diarrhoeal and Tubercular diseases.
§1844 to 1853	33.81	...	...	...
1854 to 1863	33.94	...	...	...
†1866 to 1873	31.11	17.2	123.3	13.2
1874 to 1883	26.87	16.4	104.7	11.8
1884 to 1893	25.78	16.8	95.1	9.3
1894	22.76	14.7	85.3	7.5
1895	23.11	15.1	85.3	7.2
1896	21.52	14.5	76.4	6.4
Jan. to July, 1897	19.60	13.9	64.8	‡5.4

New York City.

Death rates for all causes and for certain diseases, by decennial periods, 1844 to 1893, by years, 1894, 1895 and 1896, and January-July, 1897.

The rates given in the above tables are the crude death rates.

Table VI. shows the death rate from all causes and the rate over and under five years of age for the decennial periods since 1866, and for 1894-95-96, and the first half of 1897.

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*The population under five years of age is computed for each decennial period or year as 11.37 per cent. of the total population, based on the census of April, 1895. In 1880, the per centage of population under five years to total population was 11.63 based on the United States census of that year.

† Eight years only—1866-1873. Health Department organized in 1866.

‡ This rate is comparatively too low, as the deaths from diarrhoeal diseases are at a maximum during the third quarter of the year.

§The general death rate prior to 1851 is below the actual rate, as the registration of deaths, where burials occurred within the city limits, was not required by law.

‖ Miasmatic diseases include: Smallpox, measles, scarlet fever, typhoid fever, typhus fever, simple and ill-defined and irritative fevers, diphtheria, croup and whooping cough.

As will be seen, the average death rate in children under five for 94, '95 and '96, was 40 or more per 1,000 less than the average :e during the eight-year period ending in 1873, and in 1896 was , or 38 per cent. less than for this period. In 1897 there will un-ubtedly be a still greater diminution, although the death rate for ildren under five for the first six months of the year cannot be ken as the average for the year, as the deaths from diarrhoeal seases are always much lower during the first half of the year.

This table also shows the combined death rate from miasmatic, irrhoeal and tubercular diseases for these same periods and years, d, as will be noted, there has been a diminution of more than 50 r cent. in the deaths from these diseases during these years.

The search for the causes of diminished mortality from all causes ows that the largest reduction has been in the zymotic death rate, cluding diarrhoeal diseases of children under five, and there has en also a steady and important decline in the tubercular death te since 1886. (Table V.)

Investigation further shows that a special reduction in the mor-lity from diphtheria and croup, amounting to nearly 40 per cent., s occurred since the introduction of diphtheria antitoxin with the ginning of 1895. This reduction has taken place in spite of an crease in the number of reported cases of this disease. Up to the ginning of 1895 there had been a steady increase for some years the mortality from diphtheria and croup, and for the year 1894 e death rate was higher than that from any other single disease, cepting tuberculosis and pneumonia—pneumonia really includ-g a number of different affections. The combined death rate om measles, scarlet fever, diphtheria, croup, smallpox and ty-oid fever has been reduced almost exactly one-half within ten ars; the rate for 1896 for these diseases being 1.64 per 1.000 pop-ation, as contrasted with 3.26 for 1887; for 1897 it will apparently still lower.

The government of the United States is democratic, but the sani-ry measures adopted are sometimes autocratic, and the functions rformed by sanitary authorities paternal in character. We are epared, when necessary, to introduce and enforce, and the people e ready to accept, measures which might seem radical and arbit-ry, if they were not plainly designed for the public good, and idently beneficent in their effects. Even among the most igno-nt of our foreign-born population, few or no indications of oppo-ion or resentment are exhibited to the exercise of arbitrary power sanitary matters. The public press will approve, the people are

prepared to support, and the Courts sustain, any intelligent procedures which are evidently directed to the preservation of the public health. The belief is never aroused in any class of the population, however ignorant, that the institution or enforcement of any sanitary measure is primarily designed for the restriction of individual freedom. There is nowhere to be found any jealousy or distrust of law or government, as such. It is, therefore, possible to adopt measures more arbitrary in many respects than could be adopted in most other countries, simply because our government is democratic.

This gives the keynote to the attitude of the sanitary authorities of New York. The most autocratic powers, capable of the broadest construction, are given to them under the law. Everything which is detrimental to health or dangerous to life, under the freest interpretation, is regarded as coming within the province of the Health Department. So broad is the construction of the law, that everything which improperly or unnecessarily interferes with the comfort or enjoyment of life, as well as those things which are, strictly speaking, detrimental to health or dangerous to life, may become the subject of action on the part of the Board of Health. It attempts not only to increase the healthfulness of the city, but also to render it a more enjoyable and comfortable place of residence. In its relation to the medical profession, it aims to give every assistance which the latest scientific investigations can place within its power, in the treatment and management of communicable and infectious diseases, while not interfering in any way with the privileges or prerogatives of the medical attendant, unless such interference becomes necessary for the protection of other persons from possible infection. It prescribes specific regulations as to the management of infectious diseases, the violation of which may be followed by the forcible removal of the patient to its hospitals. The public press, quite without reference to its political affiliations, offers a unanimous and most cordial support to the policy of the Board.

The conduct of sanitary matters in New York is restrained by no traditions or precedents. It is determined from month to month, by what is believed to be for the best good of the inhabitants, in view of the most recent knowledge and the latest developments in scientific medicine.

The limits of this address do not permit, nor is it desirable, that I should touch upon many of the other phases of the work of the

lealth Department indirectly related to the prevention of disease ıd the preservation of the public health.

It has been my purpose, as was stated in the introduction, simply) detail some of the features which have more particularly distin-uished the work of the New York City Health Department and to escribe some of the phases of the sanitary supervision of certain ıfectious diseases, which have been introduced by it.

I believe it may be truly said that there is no great city in the 'orld to-day which, in the broad sense, is cleaner and healthier ıan New York. By clean is meant the purity of the atmosphere, ıe cleanliness of the streets, the abundance and purity of the water ıpply, and the efficiency of the sewerage system. I wish that so ıuch could be said as to the character of the habitations of the oor, the public baths and public convenience stations, the breadth f its parks and public commons, and the type of its charitable and enal institutions. In many of these respects New York is de-cient; but great and rapid advances have been made and are being ıade in these matters.

When it is said that no city is healthier than New York, this tatement is made with a consideration of all the sanitary factors in he situation, such as the size and density of the population, the aried nationality of the inhabitants, the character of climate, etc.

Nowhere can there be found a fuller recognition than in the Jnited States of England's high standard of excellence in public ıedicine, or a more sincere appreciation of her vast contributions o the progress of sanitary science. But she must look well to her ıurels, if her cities are to be kept cleaner than the great cities f the United States, and her urban population made healthier and appier than the same class on this side the Atlantic.

In the United States we are prepared to adopt, without hesita-ion, the best that England produces, or that the world affords, in ublic medicine, as well as in science, art and commerce; and not-ithstanding the persistent and determined efforts of our sensa-onal press, the sentiments of the medical profession, and of the eople at large, towards Great Britain are those of sincere respect or her institutions, profound admiration for her great achieve-ıents, and warm affection for her people.

If I have appeared in this address to have dwelt too long upon nd described too fully some of the sanitary methods followed in Jew York, I would urge in extenuation that it has been from a de-ire that you should know our institutions and methods, as well as

we know yours, and that through the medium of this great medical association, the largest and most influential in the world, the two great English-speaking nations might, in this respect, be brought into somewhat closer and more intelligent relations with each other. Thus the science of preventive medicine may be advanced and the people of both nations may live healthier and therefore longer and happier lives.

DIPHTHERIA AND UNSANITARY CONDITIONS.

"There are probably few districts in England or Wales of which the sanitary condition has occupied the attention of the Local Government Board more frequently or with less satisfactory result than the tract of flat marshy land extending along the south bank of the Dee estuary from Chester to the Point of Air." With this unfavorable summing up Dr. St. George Mivart opens his report on an investigation made at the close of last year into the sanitary condition of the above district, which during the last quarter of a century has been impartially visited by diphtheria, scarlatina and typhoid. Diphtheria, especially, seems to have found a congenial habitat there for a century past. "A cruel kind of quinsy" mentioned by a writer in 1796 is identified by the inspector with diphtheria, which has recently prevailed in both the urban and rural districts of Holywell in Flintshire. The condition of the urban district seems to be much the same as when reported upon in 1875, when the inspector found unwholesome middensteads, and advocated a better system of excrement removal and disposal and the provision of suitable privy accommodation. To put an end to the pollution of the Holywell brook, a comprehensive scheme of sewerage was insisted upon, including a main sewer or sewers for the removal of sewage to a distance where it might be disposed of without offence. Then as now, the removal and disposal of excrement and house refuse was left to the householders, and, as usually happens in such cases, was grossly neglected. There is no public water supply, the chief sources being two wells, one of which—St. Winifred's well—is a place of "pilgrimage." In summer there is often great scarcity, and this will continue until some means be found to wake the district council and the ratepayers out of their lethargy. There are some brick sewers of ancient date, which

e no ventilation or means of inspection, and through which le sewage finds its way plentifully into the neighboring ditches watercourses. After describing a frightful nuisance right in centre of the town, the inspector significantly adds: "It is, per- s, a sufficient commentary upon the sanitary administration of Holywell Urban District Council to record that this state of irs is found within a few yards of the council's offices." Much same defects were found by the inspector in the rural as in the an parish, and little or no improvement seems to have taken :e since a report was made in 1876. A large percentage of ses are defective, especially in regard to liability to dampness a water and sewage logged soil, conditions generally found)ciated with diphtheria. The water supply arrangements are :eptible of improvement, but the inadequate drainage is the atest evil. The rural district borders on the Dee estuary, ards which the hills slope steeply. The intervening space is :ribed as a marsh into which much of the sewage of the district already found its way, and which, if not checked, will in course me become a vast swamp. One spot, we are told, is practically ke of sewage. In justice to the rural district council it may be ed that an intercepting sewer was constructed some years ago, cost of £4,000, to convey the sewage to a proper tidal outlet; the pipes were laid in quicksands, have become displaced, and outlet is silted up. After describing a few more objectionable :ures, it is not surprising to find the inspector expressing the nion that the necessity of dealing with the drainage of parts of district is imperative. The excrement and refuse disposal angements are probably as bad as they could well be. In neither urban nor the rural districts is there accommodation for the atment of cases of infectious disease, though the need for such ommodation could scarcely be more urgent. The poverty of rural district may be accepted as a partial excuse for the absence efficient and comprehensive action, but the inspector states that ensive drainage works, however costly and difficult, must be ried out in the near future. Needless difficulties seem to arise m friction between the urban and rural district councils. The se is a typical one of the close connection between infectious ease and unsanitary conditions. If diphtheria cannot be traced ectly to such conditions, it can easily be seen how much they d to predispose people to attack.—The Surveyor, Aug. 27, 1897.

UTILITY OF QUARANTINES AS NOW CONDUCTED. —INSPECTION, DISINFECTION AND ISOLATION STATIONS*

By F. Montizambert, M. D., Edin.; F. R. C. S.; D. C. L.
General Superintendent of Canadian Quarantines.

Mr. President and Gentlemen.—In opening the discussion on "The Utility of Quarantines as Now Conducted (inspection, disinfection and isolation stations), in certain countries at least," it would seem well that I should first remind you briefly of certain familiar considerations affecting this subject in general, and then—as this is a meeting of the British Medical Association—refer more particularly to the points in which the quarantine regulations and usage of Canada differ from those of the Mother Country.

The general consideration of infectious disease, in connection with the subject of this discussion, divides itself naturally under two heads: The prevention of disease from without getting into the country, and the dealing with it once it has entered in. A system of arresting disease at the coast and frontier entrances, and a system of preparedness in the interior communities. Neither of these is sufficient without the other. Coast quarantines and inland health organizations form the double line of sanitary defense. Or, to borrow an illustration from the game of cricket, the coast quarantine may be compared to the wicket-keeper, and the inland health board to the long-stop. The interior communities throughout the length and breadth of the land have an interest, and a very close and vital interest, in the fittings and working of the quarantine service at the various ports of entry. But confidence in a quarantine system, however perfected, must never be allowed to lull us into a false sense of security, to the neglect of striving ever more and more toward the sanitary improvement of the cities, villages and districts in which we dwell.

From the long period of incubation of some of the infectious diseases, and the relative shortness of the voyage from many ports outside the country, occasional cases of infectious disease in the stage of incubation, and the micro-organisms of disease lurking in unsuspected clothing or merchandise, may pass, from time to time,

*Discussion at the meeting of the British Medical Association, Montreal, Can., September 1-4.

n an invisible and unrecognizable stage and condition, the most fficient quarantine that is practically possible. This cannot be voided without such routine detention of vessels and passengers at the ports of arrival, such routine disinfection of all clothing and nerchandise from abroad, and such consequent interference with ravel and traffic as would be altogether unjustifiable and impracicable. Quarantines must not be expected to do the impossible; nor must they be leaned upon as an excuse for lessened effort inand.

But, admitting this, they certainly may be depended upon for lealing with actual cases of infectious disease, with infected vessels nd effects, and with those suspected of being infected. In this way they strain out and protect the country from a very large perentage, indeed, of the exotic diseases, which threaten it from ime to time. And thus they do a great and invaluable work. And t is a work that is perhaps less known to and appreciated by the ublic than it should be. This is of the nature of things for all preventive work, the very success of which leads to negative rather han positive results. As long as the country is free from epidemic lisease, no one has occasion to stop to ask why this is so or to think of the work being done at the quarantines, or of the little bands of workers there, constantly facing disease and death for the protection of their country and the people who dwell inland. The one instance in 10,000 in which a case gets past the quarantine in the unrecognizable period of incubation, and subsequently develops inland, forms, naturally, the subject of widespread comment by the newspapers and the general public. The other 9,999 instances in which infectious disease is quietly arrested and stamped out at the quarantines—equally naturally—pass unnoticed, unheralded and unsung.

The quarantine regulations of Canada are framed upon the same modern general principles as are those of the United Kingdom, so far as they can be made to meet the peculiar conditions of this country. The principles upon which our regulations deal with arrivals are founded upon immediate inspection, and, when required, prompt disinfection and isolation, with notification inland to precede the passengers.

In them there is no survival of that old routine time—detention of healthy vessels—from which the modern service has inherited nothing but its unfortunate and misleading name.

In the application of these principles our differences from the

practice in the United Kingdom—as laid down in the Reports of the British Delegates to the International Sanitary Conferences of Dresden, 1893, and Venice, 1897, and in the Regulations of the Local Government Board of November 9, 1896—are mainly in three respects, and these are due to the different conditions of this country.

In the first place, healthy persons arriving at our ports in infected vessels may be held under "observation" at our quarantines during the accepted period of the incubation of the disease in question, from the ascertained date of last possible exposure. In Great Britain, from her comparative smallness in area, the number of her ports, the extent of her merchant marine, the almost continuous influx of passengers from the Continent, the shortness and compactness of her railway systems, the completeness of her inland sanitary organizations, and the perfection to which the sanitary condition of the homes of her people has been brought, this precautionary "observation" at the port is replaced by "surveillance" at the place of destination.

In Great Britain the ports are so numerous that to equip and maintain quarantines at them all would probably cost more than the average annual expense, in money, of letting in disease and fighting it inland. In Canada there are practically but four seagates of passenger entry from abroad, St. John, Halifax and the St. Lawrence, on the Atlantic side, and the Straits of Fuca, on the Pacific side. In Great Britain the rapid crossing in a few hours of passengers from the Continent offers no parallel condition for the spread of infectious disease amongst such passengers, to that obtaining in an infected vessel possibly containing hundreds of immigrants, during a passage of nearly three weeks from Asia, or of more than a week from Europe, to Canada. In Great Britain the place of destination is presumably reached within the first day after landing; in Canada it may not be reached until after a week or more of continuous railway traveling. In Great Britain it may be possible to isolate suspects in separate compartments of the divided railway carriages during the short journey from port to destination; in Canada, during the possible many days' travel in our large and undivided cars, no such isolation would be practicable; but with the coming and going of passengers into and out of the car at every station and cross-line, any infection would be liable to be spread broadcast throughout the country. In Great Britain the inland sanitary organization and the sanitary condition of the homes of the

people are considerably nearer perfection than they are, as yet, in this country.

For such reasons as these Canada can not depend to the same extent as Great Britain upon inland "surveillance." And "observation" of suspects at quarantine must form part of our system of protection. Accordingly in becoming a party to the Dresden Sanitary Convention this country accepted its conclusions fully, and without the reservation, made by Great Britain in her own case, that healthy persons landing from infected ships should not be detained.

In the second place, under the regulations in the United Kingdom, no mail matter, except that by parcel post, is liable to detention or disinfection; in Canada disinfection of the mails is not forbidden, and is sometimes considered necessary. Notably is this the case, for instance, for the local mail arriving at Victoria from China. But little is known of the sanitary conditions in the interior of China, and that little is anything but reassuring, cholera, the bubonic plague and smallpox being usually present there. The disinfection of the mails from that country is therefore considered advisable, especially in epidemic seasons, before their distribution throughout the "Chinatowns" of Victoria, Vancouver and other cities.

In the third place, the Regulations of the Local Government Board for ports in the United Kingdom limit the term "infected" to infected with cholera, yellow fever or plague. Under the Canadian regulations, actual cases of any of the infectious diseases are removable at quarantine, so as to prevent the importation of new cases, even of the minor diseases, to become fresh centers for the spread of infection throughout our country. And the arrival of all classes of infectious disease is notified inland from our coast quarantines. Under this head perhaps the most noteworthy difference between the two countries is with regard to smallpox. In the Canadian regulations, smallpox is included amongst the graver forms of infectious disease, and there are indeed special regulations concerning it. According to the English regulations, and the English usage as reported to me, a vessel arriving at a port of the United Kingdom with smallpox on board is not considered an infected vessel at all. Possibly this is attributable to the theoretical protection of the English people under the Compulsory Vaccination Act, but the somewhat extensive outbreaks of the disease which occur from time to time, such as that recently in Gloucester, would seem

to indicate that the importation of fresh entries of this disease is not without its danger even to Great Britain. In Canada the protection of the people by vaccination is not sufficiently complete to justify us in excluding smallpox from our meaning of the term "infected," as applicable to vessels and persons arriving at our seaports.

These are the chief, if not indeed the only, points in which the Canadian quarantine regulations and usage differ from those of the United Kingdom. And they are necessitated, as I trust I have established, by the different conditions of this new and extensive country.

For the rest, our regulations are based on inspection, prompt disinfection and notification inland. They are designed to secure the maximum protection of the public health with the minimum interference with travel and traffic.

With regard to our minor ports, and our land frontier, we have regulations which can be fully amplified as emergency so requires. But with respect to the importation of disease from Europe, Asia, Central and South America, etc., via the United States, and across the frontier, we put our main dependence upon their protection of themselves by the well-worked quarantines of our southern neighbors, such as those of Portland, Boston, New York and New Orleans; and their admirable national quarantine service, under the able administration of Surgeon-General Wyman, who is to join with me in opening this discussion.

In conclusion, I beg leave to submit, and to maintain, that our quarantine system, as at present conducted, is certainly of most unquestionable utility to this country.

THE QUARANTINE SYSTEM OF THE UNITED STATES.

By Walter Wyman, M. D.,
Supervising Surgeon-General, U. S. Marine Hospital Service.

Mr. Chairman and Gentlemen.—In this discussion I do not propose to comment upon the Quarantine Systems of other countries, nor to make comparisons between them and the system adopted by the United States Government. I propose rather, in the plainest terms possible, and as briefly as possible, to describe the Quarantine System of the United States, to show the condi-

ions which render the system necessary and to explain, so far as ime will permit, the rationale of the regulations.

THE DEVELOPMENT OF NATIONAL QUARANTINE.

Until 1893 there was, properly speaking, no National System of Quarantine. The Colonies had their own Quarantine regulations efore the formation of the Union, and from that event to 1893 uarantine was left to the care of the State Governments, and by he latter to County Governments or to Municipalities, as the case night be. There was, indeed, National Legislation, but all the Acts of Congress up to 1893, relating to quarantine, specifically provided that the said National measures were in aid of the State nd local authorities. Whatever opinions may have been held by nembers of the National Legislature, quarantine was permitted to e exercised by the States as a police function, and even in the present law, which gives National supremacy, it is provided that assistance shall be given the States or Municipalities by the Government authorities, the supremacy of the latter being asserted only when the State or local authorities fail or refuse to enforce the uniform National regulations.

As a result of the old system, prior to 1893, each State had its own quarantine requirements. Different cities in the same States had different requirements. One city, in order to divert trade from its neighboring rival, would be less exacting than the latter in the inspection and treatment of infected vessels. Some cities found quarantine to be a means of considerable revenue, laying heavy charges for unnecessary inspection and perfunctory disinfection of vessels. The position of Quarantine Officer became extremely lucrative, and one of the principal offices to be used as a reward for political service, and as a source from which could be derived contributions for partisan purposes. No wonder, then, that this system was faulty, a burden upon commerce, and did not protect. But while Congress had allowed, as it were, by sufferance, the State and Municipal supervision of quarantine, it never by any act abandoned or disclaimed its right to maintain quarantine under the clause of the Constitution which gives it the right to regulate commerce, and in 1893 it passed an act entitled "An Act granting additional Quarantine Powers and imposing additional duties upon the Marine Hospital Service," empowering the Secretary of the Treasury to promulgate uniform quarantine regulations for the ports of the United States, to be enforced by the State or Muni-

cipal authorities, if they will undertake to enforce them; but if they refuse or fail, directing the President to detail or appoint officers for this purpose. The law further provides that the Surgeon-General of the Marine Hospital Service, under the directions of the Secretary of the Treasury, shall perform all the duties in respect to quarantine, and to quarantine regulations, which are provided for by the Act.

In accordance with this law, regulations have been duly promulgated, and the States and Municipalities have, with unanimity, agreed to and, with some exceptions, have enforced them. To ensure their being enforced, a regular inspection is made yearly by the Marine Hospital Service of every quarantine station in the United States, and more frequent inspections when necessary at points which are particularly threatening. At a great many stations, faults in methods or appliances have been discovered, and rectified by the State or local authorities. This is prompted either by an honest desire to meet necessary requirements, or by the penalty of being superseded, under the law, by the National authorities. At a large number of ports, the quarantine has been given over voluntarily to the National Government—which exacts no fees—and at other ports the National Government has assumed charge by virtue of the law, and because of non-compliance with the regulations.

Besides the power of the National Government of taking formal possession of Quarantine, the Treasury Department has another resource in that all vessels from foreign ports before discharge of cargo or passengers, must have been legally entered by the Collector of Customs. As the Collectors are officers of the Treasury Department, they may refuse entry, unless the quarantine, as well as other regulations of the Treasury Department, have been complied with.

It should be added, and it may be confessed to be a defect in the National System, that the general Government has at present no right to prevent State or local authorities prescribing and enforcing quarantine measures over and above those required by the Treasury Regulations. The latter are minimum requirements. The States may add to them, and while in the interest of their own commerce, and as a result of an enlightened public opinion, absurd practices and those for revenue only have become far less frequent than formerly; nevertheless, such practices are to a limited extent in certain localities still exercised.

While here and there local authorities, prompted by pecuniary motives and feelings of States' rights, are protesting against the urveillance of the Federal Government, a strong sentiment for xclusive national control is developing, even in the States, which ave been heretofore most thoroughly identified with the States' ights doctrine, and also in the interior States, whose borders may ot touch the sea, but may be reached by infection brought cross it.

With the foregoing explanation, I come now to the system stablished by Congress, and which, notwithstanding the slight ariations above mentioned, is the one dominant uniform system f the United States to-day. This system begins with

SHIP SANITATION AT FOREIGN PORTS.

The law requires that every vessel leaving a foreign port for the nited States shall have a bill of health, in duplicate, signed by ne United States Consul. This bill of health contains a number f items regarding the vessel, crew, passengers and cargo, a state- ient of the prevailing diseases at the port during the previous wo weeks, and of conditions affecting the public health, and a ertificate to be signed by the Consul that the vessel has complied ith the regulations made under the Act of Feb. 15th, 1893. hese regulations are such as to ensure, so far as possible, that ne vessel is not a carrier of epidemic disease. If the Consul cannot ign this bill of health, he is not expected to give it, and without t, if the vessel attempts to enter at a port of the United States, she s subject to a fine of five thousand dollars.

It should be noted that there is no such thing as a foul bill of ealth. The vessel must be safe, in the opinion of the Consul, efore leaving the port.

Now, to assist the Consul in times requiring unusual precau- ions, the President is authorized to detail medical officers to erve as the Consulates; and in 1893, when cholera was particularly hreatening, twelve medical officers of the Marine Hospital Service ere thus detailed in foreign ports, and sixteen sanitary inspectors ppointed to assist them. The value of their services is illustrated y the record at Naples. During the season of 1893, after cholera ad been declared epidemic in Naples, three vessels left for the Jnited States—the Masilia, Weser and Cashmere—and all were ade to conform to the regulations. They all arrived at the ort of New York, with no cholera en route, or at time of arrival.

During the same period four vessels, with the same class of passengers, and their places of origin similar, in many cases identical, the water and food supply being the same as on the vessels for the United States, left for South America, and all were turned back by the South American authorities and returned to Naples. One, the Vincenzia Floria, had about 50 deaths; the Andrea Gloria, 90 on the way out—total not ascertained. Another, 84 deaths, and the fourth, 230 deaths from cholera.

The Marine Hospital Service officers were recalled in December, 1893, but the service still maintains sanitary inspectors to assist the Consuls at a number of foreign ports, as at Havana and Santiago de Cuba, Rio de Janeiro and Yokohama.

A feature of great value in connection with the regulations to be observed in foreign ports is, that they go into effect immediately, as soon as the Consul learns of the presence of epidemic disease. There is never any formal declaration of the infection of a foreign port other than the information contained on the Consular Bill of Health, or information published weekly in the Public Health Reports issued by the Marine Hospital Bureau. In 1895, when cholera became epidemic in Japan, the United States Consul immediately put into operation the regulations to be observed on vessels bound for the United States, and no cholera was brought on them.

QUARANTINE AT DOMESTIC PORTS.

Now, in speaking of the utility of inspection, disinfection and isolation stations at domestic ports, it is necessary to remark upon certain peculiar conditions attaching to the United States. First, the great number of the ports of entry, and the great length of coast line, measuring, exclusive of Alaska, 5,450 statute miles, not counting the intricacies of the shore line. Then the great population, numbering in 1890 about 63,000,000, while that of the German Empire, without its dependencies, was 49,000,000; France, 38,000,000; Great Britain and Ireland, 37,000,000; Italy, 30,000,000, and Spain, 17,000,000. The areas covered by these populations are as follows: United States, 2,970,000 square miles; German Empire, 200,000; France, 204,000; Great Britain and Ireland, 121,000; Italy, 114,000; Spain, 194,000.

Again, special conditions exist in connection with the great crowds of immigrants that daily land upon our shores. In ten years (1882-1891) more than five millions of them arrived, and in one year alone (1891) more than half a million were received.

These immigrants are from all countries, from over-populated districts; they are mainly of the poor and ignorant class, and through their baggage, as well as themselves, subject the United States to the importation of infectious disease to a degree far in excess of the exposure of any of the nations just mentioned.

Other conditions affecting the quarantine policy of the United States, are found in the great variations of climate and in the character of the commerce on different portions of our coast, by reason of which diseases much dreaded in our section give but little concern in another. There are, therefore, three geographical sections. First, the Atlantic Coast, north of the Southern Boundary of Maryland. Here arrive most of the immigrants, and our chief concern is with regard to cholera, smallpox and typhoid fever, while yellow fever excites but little apprehension. Second, the Atlantic Coast, south of the Southern Boundary of Maryland and the Gulf Coast. Here very few immigrants arrive, but on account of proximity to the Spanish Main, with its yellow fever infected seaports and because climatic conditions favor the propagation of yellow fever if introduced, that disease is the chief concern. Third, the Pacific Coast. Here there is some immigration from China, and guard must be kept against yellow fever from South America—smallpox, cholera and the plague from the Orient.

INSPECTION, DISINFECTION AND ISOLATION STATIONS.

The United States has each of the three kinds of stations mentioned in the subject of discusson. There are stations for inspection only. At these there is an examination of the bill of health, a medical inspection on the vessel, and the granting of a certificate of discharge, without which the vessel cannot be legally entered at the Custom House. If the vessel is infected, it may be remanded by the Secretary of the Treasury to the nearest fully equipped station—National or State—for treatment.

At disinfection and isolation stations the quarantine procedures are based upon the life history of the bacillus or germ of the several epidemic diseases, its period of incubation in the human being and its susceptibility to germicidal agents. When, as with regard to yellow fever, our knowledge is inexact, the regulations are based upon observation and experience. At these stations a leading principle is to clear the ship of infection, make it safe and allow it to proceed as soon as possible.

SMALLPOX.—If a vessel arrives with smallpox, the patient is removed at once to hospital, all on board are vaccinated or must show evidence of recent vaccination, or of having had smallpox. Those known to have been exposed are held under observation; others, after being vaccinated, are allowed to proceed. In case the vessel brings immigrants, it is not thought necessary to detain all of them; information is telegraphed to their points of destination in order that they may be under observation by the local health authorities. As soon as the infected portions of the vessel have been disinfected and the sick and suspects removed, and the Quarantine Officer has been satisfied as to vaccination, the vessel is no longer detained.

CHOLERA.—If a vessel arrives with cholera on board, all the passengers and all of the crew, save those necessary to care for her, must be removed—the sick to the hospital and those specially suspected isolated in barracks. The remainder are segregated in small groups, with no communication allowed between them. Those believed to be especially capable of conveying infection must not enter the barracks until they are bathed and furnished with sterile clothing, and if cholera has occurred in the steerage all occupants thereof must be bathed and their clothing disinfected. All baggage, including hand baggage and effects, accompanying steerage passengers, must be disinfected. The living apartments, and such other portions of the vessel as are liable to be infected are then disinfected. The water supply is changed at once, and the casks or tanks containing the same thoroughly cleaned, and, if need be, disinfected. The passengers are detained on account of cholera until five days have elapsed since the last exposure to infection, and a final disinfection of their effects required before discharge.

YELLOW FEVER.—With regard to yellow fever, the regulations vary according to the season of the year. From the 1st of May to the 1st of November vessels arriving at ports on the Atlantic and Gulf Coast, south of the Southern Boundary of Maryland, if from yellow fever infected ports, undergo the same process as though they were actually infected. Those arriving at northern ports are not thus treated. Following are the regulations for the treatment of vessels infected or suspected of being infected with yellow fever:

Some exception is made to the above with regard to iron steam vessels bringing passengers, but stringent and specific require-

nents are made of these latter, such as immunity of the crew to ellow fever, the mooring of the vessel in the open harbor at the oreign port, non-communication of the crew with the shore and mmunity to yellow fever of the passengers—no bedding or house- ıold effects being allowed shipment, and all baggage to be disin- nfected, unless checked through under special regulations to ıorthern ports.

DISINFECTING AGENTS.

The disinfecting agents used at quarantine stations are steam, ulphur dioxide, bichloride of mercury in solution and formaldehyd ;as, the use of the last having been recently authorized by Depart- nent Circular. Time will not permit a full description of the ıppliances and processes connected with each agent. It must uffice to state in a general way that steam is ordinarily used for he disinfection of clothing and dunnage, in an iron and cacketed :hamber, provided with a vacuum apparatus. There are thirty-five of these steam chambers in operation at the several quarantines in he United States. Occasionally steam has been used also for the lisinfection of the living apartments of vessels above the water ine.

Sulphur dioxide is used for the disinfection of the holds of essels, and of special apartments, and is generated from a specially levised furnace provided with a fan-blower for forcing the fumes of sulphur into the vessel's hold. The regulations require that the ulphur dioxide shall be of a 10 per cent. per volume strength to nsure penetration to all parts of the vessel, especially those parts which are constructed of wood, for it requires a 6 per cent. per olume strength to penetrate wood containing 10 per cent. moist- ıre, and the additional 4 per cent. is required to ensure safety.

Three per cent. volume strength is sufficient for most of the non spore bearing micro-organisms when they can be reached. The ıction of the gas on infected fabrics when in less than 6 per cent. is extremely variable. A strong solution of the gas is always required when such articles are to be disinfected. Mattresses, pillows and ıpholstered furniture cannot always be disinfected by the gas even when large percentages of the gas are used.

The bichloride mercury in solution is used for the dipping of stone ballast, and the washing of the forecastle or cabin, and occasionally the washing down of the hold of the vessel.

Formaldehyd gas may be used instead of steam, as it is not

injurious to fabrics. It is believed that it will in time prove to be a cheaper process, while its germicidal action is undoubted. The apparatus necessary for its generation and subsequent neutralization can be readily attached to the steam chambers now in use.

There are in the United States about 120 inspection stations; 26 of these are provided with disinfecting appliances, steam chambers, sulphur furnaces, and tanks for bichloride of mercury solution, and of the 26, 8 of the stations are provided with means of detention of persons held under observation.

ISOLATION STATIONS.

Isolation stations are chiefly in the north, at ports where immigrants arrive. A fair example may be cited in the United States Quarantine Station at the Delaware Breakwater, where barracks have been erected to accommodate nearly 1,000 immigrants while being held under observation.

The utility of these stations has been proven by success in the prevention of the introduction of epidemic diseases in the past few years.

In 1892 cholera gained admission into New York City, but not in the interor, but this was before the passage of the present quarantine law under which the present quarantine regulations have been promulgated.

In 1893 several vessels arrived at the New York quarantine, infected with cholera, but cholera did not gain admission if we except two isolated cases in Jersey City, from which there was no extension of the disease, and concerning the origin of which no satisfactory explanation has yet been made. The widespread prevalence of cholera in Europe in 1892-3 will be remembered, and history shows that an European invasion was formerly invariably followed by an invasion of the United States. In 1893, however, its invasion was prevented.

During the present century, up to 1894, there were but seven years in which yellow fever did not visit the United States. It is now four years since it has gained admission, the last time being at Brunswick, in 1893, before the present regulations were in operation. The last great epidemic was in 1878, and in that year yellow fever invaded 132 towns of the United States, caused a mortality of 15,934 persons, and the pecuniary loss to the country has been stated as $100,000,000 in gold. The disease is constantly threatening the United States from Cuba and other ports in the Spanish Main, and to my mind there can be no question that to the quarantine restraints are we indebted for immunity since 1893.

The utility of quarantine is also illustrated by the epidemic inflictions upon those countries which have no quarantine, or whose quarantine is but a name, as that of the Island of Cuba, where smallpox is readily introduced from Spain and the Isthmus of Panama, where yellow fever has been introduced during the present summer through want of quarantine precautions.

Again, the disaster and death caused by the absence of proper quarantine facilities is strikingly illustrated in the history of those ships previously mentioned which went from Naples to South America, where because of a want of proper quarantine protection the authorities saw fit to turn them back—a harsh and cruel measure, each ship a floating charnel house, returning across the sea to its port of departure, Naples, leaving in its wake a string of dead bodies, the victims of cholera infection. Humanity, therefore, demands quarantine. I am well aware of the prejudice against quarantine caused by its absurdities and the preference that has been expressed for the sanitation of cities, so that even if epidemic disease is introduced it will not spread. But modern scientific quarantine is nothing more than sanitation of ships and the necessary precautions to prevent the spread of disease; and no protests are more vigorous than those of quarantine officers against the continued infection of ports and places which, with a due regard to healthful conditions, and some expenditure of money for sanitary engineering could be deprived of their character as foci of infectious diseases.

THE RELATION OF FEDERAL TO STATE QUARANTINE.*

By R. M. Swearingen, M. D.,
State Health Officer of Texas, Austin, Texas.

In 1892, when cholera started out on its pilgrimage of devastaton, the governments of all civilized countries inaugurated vigorous measures of protecton against its invasion.

As a rule, when men, individually and collectively, do things under the inspiration of a panic, they do very unwise things; and when the danger has passed the folly of their acts becomes apparent.

*Read at Conference of State Boards of Health, Nashville, Tenn., August 18, 1897.

The national cholera-fright of 1892 and 1893 painfully illustrates this general proposition. The Congress of the United States at that time enacted laws that would not, I verily believe, under ordinary circumstances, receive a moment's consideration. The quarantine act of February 15th, 1893, confers upon the Treasurer of the United States Government the power to set aside at his option, the health laws and the health officers of any State, and authorizes the President of the United States to formulate rules and regulations in lieu of said laws, and to substitute Federal for State quarantine officers to enforce them; it further imposes upon the Treasurer of the United States the duty of making rules for the guidance of State Health officers.

Article 3 of the act referred to, directs that "the Supervising Surgeon-General of the Marine Hospital Service shall, immediately after this act takes effect, examine the quarantine regulations of all the States and municipal boards of health, and shall, under the direction of the Secretary of the Treasury, co-operate with and aid State and municipal boards of health in the execution and enforcement of the rules and regulations of such boards, and in the execution and enforcement of the rules and regulations made by the Secretary of the Treasury to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, and from one State or territory into another," etc.; and when said rules and regulations have been made they "shall be promulgated by the Secretary of the Treasury, and enforced by the sanitary authorities of the States and municipalities, where the State or municipal health authorities will undertake to execute and enforce them. But "if the State or municipal authorities shall fail or refuse to enforce the said rules and regulations, the President shall execute and enforce the same, and shall adopt such measures as in his judgment may be necessary to prevent the introduction and spread of such diseases, and may detail or appoint officers for that purpose."

When this remarkable enactment is stripped of its technical verbiage, in plain English it means that sovereign States can not be entrusted with the police regulations necessary to protect the public health, and that the Federal Government, with vastly superior knowledge, must stretch forth its mighty arms for our defense.

In this law there is no provision made for testing the merits of any controversy that might arise between State and Federal

ıthority, nor of deciding questions of competency of any officer, ›r for court-martial in case of charges of incompetence or neglect duty; no civil service examination; no tribunal before which ıall be determined the grave question of setting aside the laws a State. It depends solely upon the opinion of the chief, and his ›inion, upon the report of some inspector of the Marine Hospital ervice, to the effect that the State rules are not satisfactory. /hat a parody on constitutional government! When one man, ithout even the form of trial, can set aside the laws of a State, it a despotism, subversive of every principle of freedom, and ıworthy of the American people.

In order to have unmistakable evidence that the State health ficials are complying with all the rules and regulations that have nanated from this great central source of sanitary knowledge, spectors are sent all along the lines of coast quarantine at stated tervals, and many questions are asked, and the most minute vestigation is made into everything pertaining to the administra-›n of State quarantine.

Such surveillance will necessarily lead to complications and nbarrassment, no matter how wisely the rules may have been rmulated, nor how discreetly they may be executed. An illustra-on recently occurred in my State. I received the following tele-ram:

"WASHINGTON, D. C., July 19, 1897.

'r. R. M. Swearingen, State Health Officer, Austin, Texas:

"Dr. Magruder, Inspector of the Marine Hospital Service for exas, reports location at Sabine Pass station dangerous in the ıtreme. Fifty men working on wharf thirty yards from station; essels from infected port of Vera Cruz, Mexico, arriving. Can ou place inspectors lower down? Immediate action necessary. lease wire. (Signed)

"WYMAN, Surgeon-General."

That telegram had an ominous meaning; a kind of portentous gnificance, well calculated to disturb the repose of even an old uarantine officer. Fortunately I had, but a few days before the ceipt of this startling information, visited the station at Sabine ass, and I was in a position to know, and did know as much ›out the situation as did Dr. Magruder, and I can assure this con-rence that I had not felt a single ripple of apprehension. Dr. A. . Perkins, the State Quarantine Officer in charge of the station,

has served there fifteen years, and is thoroughly familiar with the duties of the position. He is strictly competent, fearless and vigilant. When ships arrive from interdicted places they are carefully inspected, and if any real danger exists the most complete isolation is enforced. When no danger is apprehended he tries, in the interests of commerce, to make the burdens of quarantine as light on sailors and ship owners as can be done consistently with good discipline; but he takes no risks nor chances.

In order to throw the lights on this very dangerous condition of things, it will be necessary to give a little unwrittetn history. The lesson will not be lost, as it brings out very clearly the advantage of knowing real dangers from imaginary ones, and shows how easy it is for those unacquaintetd with local interests to be misinformed and mislead.

Sabine Pass is a small village at the mouth of the Sabine River, the dividing line between Louisiana and Texas. It has been for a number of years a lumber shipping point of some importance. Within the last year or two, the channel has been deepened to a depth of twenty-three feet of water, and the trade has greatly increased. The quiet little village has been converted into a bustling town, with limitless possibilities. The Kountz Brothers, of New York, a wealthy firm, have bought up nearly all the river front near the mouth of the river, and are building a new town, to be called by the euphonious name of "Kountzville," in honor of its great founders. The brothers are having cut water slits, or docks, to be leased to private parties or corporations, for exclusive privileges, where railway trains can be run alongside the docks and discharge or receive freight direct from ships. One of these docks or basins, is excavated within fifty yards of the present State quarantine station, but it was planned at that particular place for the specific purpose of forcing the State to move her station. As the State occupied land claimed by the Kountz Brothers there was no alternative. But it required time to get permission from the Secretary of War for making permanent improvements on the main channel of a port of entry.

The enterprise was pushed with great energy by the State Health Officer of Texas, but not fast enough for these enterprising town builders. The dock referred to as being near the station had been rented, I was informed, to a lumber company of Beaumont, for some $500 a month; but the said lumber company will not commence operations until the quarantine station is removed.

Of course, $500 a month is a very important consideration, and the anxiety to secure it made the owners impatient and desirous to have a new station. In fact, all at once they became fearfully apprehensive that a yellow fever epidemic would strike this enterprising community if the station was not removed instanter. To accelerate my slow movements and hasten the removal of the station to another point, they appealed to the Marine Hospital Service, and an inspector from that department has been assigned to the special duty of watching that port, and the new town has the rare distinction of having her health interests guarded by representatives of both State and National Governments.

Let us pause here, and analyze the meaning of the expression "State and Nation," and endeavor to arrive at some conclusion as to the rightful jurisdiction of these respective officers.

Judge Cooley tells us that "A State is a society of men, united together for the purpose of promoting their mutual safety. In American Constitutional Law the word 'State' is applied to the several members of the American Union; while the word 'Nation' is applied to the whole body of the people embraced within the jurisdiction of the Federal Government. 'Sovereignty,' as applied to States, imports the absolute supreme power by which any State is governed.

"There is a division, however, of the powers of sovereignty between the National and State Governments, by *subjects*. The former being possessed of supreme, absolute and uncontrolled power over certain subjects throughout all the States and Territories; while the States have the like complete power within their limits, *over other subjects*. The Constitution is the fundamental law of a State or nation, and it must regulate this division of sovereign powers."

The Declaration of Independence made every State a sovereign and independent State, and individual States at first assumed and performed all the functions of government. It required but a few years to demonstrate the necessity of limitations of authority between States and between the States and the general government. "The Congress of 1775 and 1776 was strictly a revolutionary body, and like all revolutionary bodies its authority was undefined." As the exigencies of occasion evolved the need of changes in the original articles of confederation the changes have been made; and the friction between the National and State systems of government has been harmoniously adjusted. There has always been a

strong party clamoring for greater centralization of power at the national capital, but the old doctrine of State sovereignty that had its birth in the organization of the Federal compact is still adhered to by the majority of the States, and the dignity of Statehood asserted and maintained. Now, jurisdictions are defined and rights are fixed. Among the exclusive rights thus fixed, and heretofore sedulously guarded, no single right has a firmer hold upon the people than the right to protect their health and lives by local self-government. The officers of the State should be the custodians of the public health of each State, and the assumption on the part of the Federal authorities that a surveillance by their inspectors is necessary not only violates the Constitution of the United States, but it is tantamount to a declaration that the State officials cannot be entrusted with so imporant a function.

Judge Cooley in his "Constitutional Limitations" weighed with much ability and deliberation these fine points of governmental policy, and his interpretation is the recognized authority. On page 575 of that work he says: "In the general police power of a State, persons and property are subjected to all kind of restraints and burdens, in order to secure the general comfort, health and prosperity." In the American constitutional system the power to establish the ordinary regulations of police has been left with the individual States, and cannot be assumed by the National Government." "Neither can the National Government, through any of its departments or officers, assume supervision of the police regulations of the States, so long as they do not invade the sphere of national sovereignty, and impede the exercise of any authority which the Constitution has confided to the Nation." "Numerous illustrations," he adds, "might be given of the power of States to make regulations affecting commerce, which is sustainable as regulations of police." "Among these are *quarantine regulations and health laws.*"

Allow me to repeat one paragraph from this great jurist: "Neither can the National Government, through any of its departments or officers, assume any supervision of the police regulations of the States." It would be interesting to learn how the expounders of the Constitution can reconcile this clause, prohibiting the supervision of police regulations by the National Government over States, with article 3 of the act of 1893, directing the supervising Surgeon-General immediately after the act takes effect to examine the quarantine laws of all the States, and to do precisely what the Constitution says he shall not do.

Without considering the question of reserved rights and con-
tutional inhibitions, it seems from the very nature of things
at public health could be more satisfactorily protected by the
ate authorities than by other organizations beyond the State
nits.

Officers are responsible to their constituents, and must render
account of their stewardship to them. The endorsements and
provals of the people for all public service is the incentive for
thful performances, and the rewards for duties done. The
rgeon-General of the Marine Hospital Service in his office at
ashington cannot feel the responsibility as would the chief health
icer of any State; nor could the people of any State have an
portunity to show their approval or disapproval of his official
ts.

The only argument brought in support of the proposition to
egate the whole matter of quarantine protection to the general
vernment is that it would be a saving to the State; inasmuch,
:y say, as a border State keeping up coast quarantine is paying
· the protection given the interior States incidentally. Those
ıo advocate this measure on this ground certainly take a super-
ial view of the subject. An appropriation by the Legislature of
State is more tangible and apparent to the casual observer, but
moment's reflection will satisfy any thoughtful man that one
ate will not lift the burden of taxation from another State by
aring her quarantine expenses, and that each individual State
ıst, either directly or indirectly, through the tariff system, bear
pro rata share of government cost. Regarding, then, this ques-
ın from an economic standpoint, it is fair to assume that the
ople of a State can select officers as much imbued with patriotic
terest, and as fully informed on the subject of economy as would
representatives of the Federal Government.

In conclusion, I beg leave to say that this paper is not written
r the purpose of criticising the Marine Hospital Service, but to
view the law as enacted in 1893, and to show its defects. That
w ought to be repealed, or materially changed. It violates the
ɔnstitution of the United States, and insults the dignity of sov-
eign States by forcing a surveillance upon them that must be
distasteful to those who execute it as it is humiliating to those
ho are compelled to submit to it.

I deem it especially incumbent upon this conference to consider
ıd take action upon these great questions. We are confronted by

a growing power that threatens to monopolize all sanitary matters and control all systems of public health. The evolution of the Marine Hospital Service within a few years from a charitable institution, caring only for sick sailors, into a vast machine of power, is one of the marvels of the century; and unless a halt is called, it foreshadows, at no distant date, the doom of all State and municipal quarantines.—The Texas Medical Journal.

MINERAL WOOL appears on the market in a variety of colors, principally white, but often yellow or gray, and occasionally quite dark, and is made by converting scoriae and certain rocks, while in a molten state, into a fibrous condition by a steam blast directed against the liquid material. Blast-furnace slag forms the raw material for one variety of the wool and sandstone for another, yielding, respectively, slag wool and rock wool, the latter being preferable for pipe covering, because of the absence of sulphur, which, with moisture present, becomes an active corroding agent.

The furnace slag or the rock, as the case may be, is melted in a large cupola, and as it trickles out at the tap hole in a somewhat sluggish stream it meets a high-pressure steam jet which atomizes the woolen material, if it may be so termed, blowing it in fleecy clouds into the storage room provided for it. Soft and downy, the stuff settles wherever a resting-place offers itself, the heavier wool coming down first, while the lighter portions are blown further along by the force of the steam and settle in the more distant parts of the room. The material thus naturally grades itself into varieties of different qualities.

A thousand pounds of wool per hour are turned out by one of the cupo'as, and after the storage room has been blown full, the flocculent mass is pushed into bags, ready for the market. The whole process affords an admirable and interesting illustration of the utilization of a formerly waste product.

The wool itself, serving a variety of useful purposes, as a non-conducting covering against heat and cold alike for steam pipes and cold-storage-room walls, as a sound deadener in floors of buildings, and as a means of fireproofing, is, as its name implies, a soft and wooly substance, consisting of a mass of very fine mineral fibers interlacing one another in every direction, and thus forming an endless number of minute air cells.—M. F. Merritt, U. S. Consul at Barmen.

CLOTHING AND TEMPERATURE.

From the "Monthly Weather Review" for May, 1897.

To acquire some concrete idea of the influence of general meteorological conditions upon personal comfort and upon the efficiency of clothing in different conditions of weather, the writer undertook a series of observations of the temperature of certain parts of the clothing and of the body.

The series comprised observations of temperature between the coat and vest, the vest and linen shirt, the linen shirt and woolen undershirt, the undershirt and skin, and the temperature of the body under the tongue.

The series may, for convenience, be subdivided into four sets or subseries: 1st, a set of observations made indoors; 2d, a set made after free exposure out of doors for ten minutes; 3d, a set made after free exposure out of doors for twenty minutes; 4th, a set made ten minutes after returning indoors. All observations were made in the shade; the first and fourth sets in a room in the Weather Bureau building, and the second and third in the shade of the same building, and in situations so chosen as not to interfere with the free movement of the wind.

The thermometers were in position for ten minutes before the readings were recorded for the first set, and the readings for the other sets were made at the consecutive ten, twenty, and thirty minute periods thereafter.

The period of the day selected for the series was that between 1:50 and 2.30 P. M. This period was selected in order that the outdoor sets might coincide approximately with the 2 P. M. local meteorological observation made by the Weather Bureau in this city (Washington).

The first observations of the series were made on February 4, and the last on February 16, 1897, eleven days in all. The continuity of the record of the temperature of the body in the mouth was broken by an injury to the clinical thermometer on February 11; a new one was obtained and used on February 16. The series was terminated sooner than contemplated by an attack of bronchitis, rendering it imprudent to continue the personal exposure involved in the prosecution of the observations in cold air.

The clothing worn during the series consisted of a serge coat and vest, a linen shirt, and woolen undershirt. This weight of clothing was very comfortable while indoors, and with the addition of an overcoat was ample for outdoors, but while making the observation

no overcoat or additional clothing was worn. The coat and vest were single-lined with a light-weight material, the linen shirt of the usual quality, and the woolen undershirt of the material known as fleece-lined flannel.

The following are the average values of each of the subseries, and also the average of the 2 P. M. local meteorological observation. The details of each are shown in the appended table:

First set. Indoors. Average of eleven days.

	° F.
Temperature of room	76.5
Temperature between coat and vest	84.9
Temperature between vest and linen shirt	87.4
Temperature between linen shirt and woolen undershirt	90.3
Temperature between woolen undershirt and skin	95.5
Temperature under the tongue (average of six days)	98.5

Second set. Outdoors ten minutes. Average of eleven days.

Atmospheric temperature	39.3
Temperature between coat and vest	65.3
Temperature between vest and linen shirt	74.6
Temperature between linen shirt and woolen undershirt	81.3
Temperature between woolen undershirt and skin	93.8
Temperature under the tongue (average of six days)	98.3

Third set. Outdoors twenty minutes. Average of eleven days.

Atmospheric temperature	39.3
Temperature between coat and vest	61.1
Temperature between vest and linen shirt	69.7
Temperature between linen shirt and woolen undershirt	78.1
Temperature between woolen undershirt and skin	92.6
Temperature under the tongue (average of six days)	98.0

Fourth set. Ten minutes after returning indoors. Average of eleven days.

Temperature of room	75.7
Temperature between coat and vest	77.9
Temperature between vest and linen shirt	80.8
Temperature between linen shirt and woolen undershirt	86.3
Temperature between woolen undershirt and skin	93.1
Temperature under tongue (average of six days)	98.0

Average of 2 P. M. meteorological observations for eleven days.

Temperature of air	39.3
Temperature of wet-bulb thermometer	36.0
Relative humidity	73.0
Absolute humidity (grains per cubic foot)	2.08
Velocity of wind (miles per hour)	8.3

From the limited character of these observations it is not ex-ected that the values derived from them will have other than a ry restricted application. The chief reason for publishing them their present shape is that the field of inquiry suggested by them an extensive one and should yield to more complete investigation any facts of great practical utility; and, furthermore, because ith the exception of some similar observations quoted by Von ebber as having been made by Rubner, they are the only ones of e kind known to the writer.

The following values are given by Van Bebber (Hygienische leteorologie, W. J. Van Bebber, 1895, p. 132):

	Atmospheric temperature.	
	50° F.	79° F.
emperature between coat and vest.....	73.6	83.8
emperature between vest and linen shirt.	75.9	84.7
emperature between linen shirt and woolen shirt	77.4	85.3
emperature between woolen shirt and skin	90.9	89.9

The statement of the atmospheric temperature is the only infor-ation given relative to the meteorological conditions under which ese values were obtained.

At the present time it would evidently be imprudent, with the anty data available, to dogmatize as to the relative importance either the different meteorological elements or the various parts nd qualities of clothing, but the following points appear noticeable ough to mention: The temperature of the different layers of othing was influenced decidedly by the prevailing temperature of e immediate surroundings, the former rising and falling with ses and falls in the latter, but the degree of change was variable, nd perhaps, if not certainly, was very much affected by the veloc-y of the wind. There was one point wherein a result of the riter's experiments differed from a corresponding one as given by an Bebber, *i. e.*, that the lower the atmospheric temperature the wer also was the temperature between the woolen shirt and the in. This was contrary to Rubner's experience, and is worth lling attention to, inasmuch as Rubner appears to have attached uch significance to the increased temperature between the skin nd undershirt at the lower atmospheric temperature.

Another point noticed was in connection with the temperature the body as shown by that taken in the mouth. Upon going

outdoors the body temperature always fell, and the fall was greater in proportion to the time of exposure. Furthermore, upon returning indoors it did not rise quickly, but ten minutes afterward remained as low as the last observation outdoors. Although no systematic observations were made with reference to ascertaining the time required for the body to regain its original degree, yet in the few casual experiments that were made it took from twenty to thirty minutes.

TRIALS OF GAS STOVES.

The London Journal reports the following summary of the more important results of a number of trials of heating with gas stoves, of which voluminous reports have recently been published, by Prof. A. von Ihering, of the Imperial Technical High School at Aix-la-Chapelle, in the Journal fur Gasbeleuchtung:

A room having an air space of about 3,170 cubic feet was chosen for the trials. The walls were exposed on the south and west, and on the east only abutted on the hall and staircase, so that the loss of heat through them was relatively great. Eight different makes of stoves, sent out as suitable for heating a room of the above capacity, were used; and the trials were directed specially to the following points: (1) The consumption of gas needed to make the room warm; (2) the consumption of gas needed to maintain it at a given temperature; (3) the composition of the gas; (4) the temperature of the exit gases; (5) the loss of heat in the exit gases, or the utilization of the heat generated in the stove; (6) the heating value of the gas used; (7) the amount of carbonic acid in the air; (8) the temperature of the room at different points, and (9) the mean temperature; (10) the degree of moistness of the air; and (11) the relative quantities of heat radiated from the reflectors.

The stove on tial was placed in the middle of the east side of the room—beneath the mouth of the chimney—and the gas meter in the northeast corner of the room. The outlet pipe was forked, so as to admit of the introduction of a temperature regulator in one branch. The two branches were furnished with stopcocks, the main tap being placed on the inlet to the meter. A fourth stopcock was provided on the pipe, close to the stove itself. By this arrangement it was possible to work either with or without the tempera-

ure regulator. The main tap was only used in the trials made on all the stoves at a fixed consumption of gas. The products of combustion were conveyed to the chimney by a pipe $3\frac{1}{8}$ inches internal diameter, and about 6 feet in length, with which a tight joint was made to the stove. A hole was bored in the pipe 8 inches above this joint for the insertion of a cork through which a thermometer was passed, so that its bulb reached to the middle of the pipe. Opposite the thermometer the pipe was bored, and a tube fixed in it for the withdrawal of samples of the hot gas. A Böhm temperature regulator was used. Its action depends on the partial closing of a valve set in the supply pipe, by the extension of a spring, which is very sensitive to small changes of temperature. The temperature was taken by 19 thermometers, of which six were on the floor level, four in the corners of the room, and one in the middle of the east and one in the middle of the west wall. Six were placed 5 feet 2 inches above the floor; and six more above them and close to the ceiling ($9\frac{1}{2}$ feet from the floor). The three thermometers of each set were in a vertical line. One thermometer was suspended at a height of 5 feet in the middle of the room. These nineteen thermometers were read hourly, as were also one in the middle of the room adjoining the experimental room on its north side, one on the staircase, one in the room below, one in the room above the experimental room, and one placed outside the window of the room on the north side. The latter served to give the temperature of the outer air; but its readings were compared with the various temperatures recorded at the local meteorological office. This office was at the same altitude, and only 100 yards distant, so the barometer readings taken there sufficed.

The spent gases were analyzed in an Orsat's apparatus, and two or three analyses were made for each trial. The temperature of the spent gases was read each time. To ascertain the excess of air, the free oxygen was determined as well as the carbonic acid. Carbonic oxide could only be detected by the palladium paper reaction either in the exit gases or the air of the room. The carbonic acid in the latter was determined by aspirating 10 litres of air through a weighed caustic soda tube protected by calcium chloride. The sample of air was drawn at a height of about 32 inches, and at about 20 inches from one side of the stove. To ascertain if the air of the room was rendered more dry or more humid by the gas fire hydrometers were suspended half way up the walls on the west

and east sides of the room. In order to draw conclusions as to the degree of perfection of the construction of the reflectors it appeared desirable to estimate the heat radiated from them. For this purpose readings were made at nine places in the plane of radiation of the stove with a thermopile and galvanometer. An attempt to ascertain the absolute value of the heat radiated by means of a calorimeter coated with lampblack was not successful, as heat rays issued not only vertically to the plane of emission, but also obliquely, and the latter did not strike the calorimeter.

It was desired to make an extended trial of each stove, as well as the ordinary day trials, but this could not be carried out with all the stoves, owing to the room being needed for other purposes. The time and consumption of gas required to raise the room to 68° F. were first ascertained, and then the gas consumption necessary to maintain the temperature. On the following day, after raising the room to the above temperature, the gas consumption was set at 17.6 cubic feet per hour, and the trial continued for seven hours. In some cases a continuous trial lasting one week, with the temperature regulator in action, was made. The weather was for the most part very unfavorable to the trials, and the temperature outside was very seldom below freezing point. The house in which was the experimental room had been uninhabited prior to the trials, and a gas stove was therefore kept burning in that room for 17 days before the trials were begun. At the close of each day's trial the doors of the room were opened, so that by the following morning the room had attained the temperature of the rest of the house, which remained almost constantly between 41° and 43° F.

The heating value of the town gas was ascertained both calorimetrically and by calculation from its composition. Thirteen determinations by Junker's calorimeter gave a mean value of 155.8 calories per cubic foot. To calculate the heating value of the gas from its composition by Slaby's formula, the density of the unsaturated hydrocarbons in it must be known; and to find this the specific gravity of the gas was determined before and after their removal by fuming sulphuric acid. The mean of 12 analyses of the gas showed its percentage composition to be—

Hydrogen.	Methane.	Carbonic Oxide.	Hydro-carbons.	Nitrogen.	Carbonic Acid.	Total.
54.0	34.2	5.2	3.3	2.2	1.1	100

The mean specific gravity by Schilling's effusion apparatus was 0.3826. From the above and other calorimetric determinations, and from the values calculated from the analyses, it was found that the mean calorific value of the gas was 155.7 calories, taking the water formed as liquid.

The quantity of air needed for the combustion of the gas, and the volume of the products were calculated. One part by weight of each of the following gases requires the stated parts by weight of air for its combustion—

	Hydrogen.	Unsaturated Hydrocarbons.	Methane.	Carbonic Oxide.
Air needed.....	34.39	14.667	17.11	2.457

From these data, the gas in question was found to require 5.466 times its volume at 15° C.; and 760 mm., or 5.1816 times its volume at 0° C. and 760 mm. It yielded 6.201 times its volume of products of combustion at 15° C.; and their percentage composition was: Carbonic acid, 8.392; aqueous vapor, 21.597; nitrogen, 70.011. The volume of gas and air together was 6.466; and therefore the contraction on combustion amounted to 0.265 or 4.1 per cent. of the original volume. The next table shows the percentage composition of the products of combustion with different proportions of air—

Volumes of Air in Terms of the Theoretical Quantity Needed.	1	1.5	2	3	4
Carbonic acid..	8.392	5.825	4.461	3.038	2.304
Aqueous vapor..	21.597	14.993	11.480	7.829	5.928
Nitrogen	70.011	72.728	74.170	75.685	76.460
Oxygen	—	6.452	9.880	13.463	15.310

The general equation for calculating the quantity of air from the proportion of carbonic acid in the products of combustion was deduced. If a = the percentage by volume of carbonic acid, and m = the multiple of the theoretical volume of air required, then—

$$m = \frac{49.36 - 5.8819a}{5.1816a} + 1$$

The quantities of air for all the trials were deduced by aid of this equation. The value of m thus found permits of the volume of the exit gases at the temperature at which they leave the stove being readily deduced. With m times the theoretical quantity of air required for x volumes of gas burnt per hour, and with the exit

gases at $t°$ C., and the barometer standing at b mm., the volume of exit gases per hour would be—

$$-(0.739 + 5.4.66m)\, x \frac{760}{b} . \frac{273}{288} \frac{t}{}$$

The volumes of exit gases for all the trials were deduced from this equation.

The specific heats for a temperature of 100° C. are, according to Slaby: For carbonic acid, 0.216; for aqueous vapor, 0.459; and for nitrogen, 0.247. These values, with the proportions by weight of the respective gases found in the exit gas from the combustion with the theoretical quantity of air, show a loss of 5.55 calories in the exit gases from the combuston of 1 cubic foot of gas for a difference of 100° C. between their temperature and the temperature of the room. But a cubic foot of gas develops 155.7 calories. The latent heat or heat of vaporization of water amounts, however, to about 17 calories, and hence the calorific value of a cubic foot of the gas, supposing the water formed by combustion remains as steam, is only 155.7 — 17.0 = 138.7. The loss of heat through the exit gases is, therefore, equal to $\frac{5.55 \times 100}{138.7}$ or 40 per cent. of the total available heat of the gas. With m times the quantity of air theoretically required for the combustion, the heat lost through the excess of air is 4.51 (m — 1) calories per cubic foot of gas consumed for a difference of temperature of 100° C.; and the total quantity of heat lost per hour becomes = 5.55 + 4.51 (m — 1) 4.51m + 1.04, or for every degree difference between the temperature of the exit gases and that of the air of the room the loss of heat per cubic foot of gas burnt is equal to 0.0451m + 0.0104 calories. By the aid of this factor, the loss of heat for any given consumption of gas, and any difference in the temperature of the air and exit gases, is readily calculated.

The results of the more important trials are given in the foregoing table, which is compiled from the immense mass of figures given by Professor von Ihering. The examples have been selected with a view to giving a fair impression of the general efficiency of heating by gas; and they are not necessarily indicative of the relative merits of the different makes of stoves. Experiments were made with Michel's stove on the influence of the size of the exit flue. Screens or dampers fitting the pipe closely, and each having

circular hole of known diameter, were inserted in turn at the base f the pipe. The greatest efficiency was found when the orifice was nly 0.79 inch in diameter. The heat lost in the exit gases was then nly from 3 to 5 per cent. of that developed; and this result apeared to be due to a reduction of the excess of air, brought about y the contraction of the flue. The efficiency increased with a dimnution of the gas consumption. The Dessau and Siemens' stoves owed similar results when the regulating flap in the exit pipe was artially shut so as to contract the outlet to about 0.79 inch.

It appears that, by selecting an exit pipe of suitable diameter, he efficiency of the stoves can be raised from 80 to 96 or 97 per ent. A low temperature of the exit gases is found with the Graf tove. This is in part due to a narrow outlet, and in part to a water ooler which enters into its construction. The water began to boil ithin a quarter of an hour of the lighting of the stove and continued a state of noisy ebullition, while the humidity of the atmosphere ecame so great that water condensed on the walls, etc., and the rial had to be broken off.

On comparing the transmission of heat by the walls with figures btained by the use of the generally recognized coefficients for the arious materials, it was found that nearly one and a half times the alculated amount of heat was actually transmitted. It appeared he coefficients were too low—especially for outer walls, and the oefficient for heat transmission should be about 50 per cent. higher or new buildings than for old ones which have been inhabited for long period.

With regard to the amount of carbonic acid present in the air of he room, it is to be observed that the room was ventilated through he doors only, and that windows were not opened during the coninuance of the trials. Consequently air containing much carbonic cid may have remained near the floor of the room. The samples f air for examination were taken at a height of 32 inches, and there ere found from 2.85 to 7.16 parts per 1,000 of carbonic acid.

The experiments on the radiating efficiency of the reflectors howed that the radiant heat increased with the consumption, and lso increased with a diminution of the exit pipe. The Warstein tove appeared to have the most efficient reflectors, and next in rder came the Michel and the Siemens. With these two, the adiation from the lower part of the reflectors was far greater than rom the upper.—American Gas Light Journal.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Extracts from the proceedings of the recent International Medical Congress at Moscow:

Diabetes.—M. le Dr. Pavy presented to the Section de Médecine of the Congrès International de Médecine of Moscow, Le Progrès Médical, a report on Diabetes, of which the following is a summary:

Diabetes consists in a defect of assimilation by the animal organs of the carbo-hydrates. A comparison made between a person in good health and one having diabetes, after the ingestion of saccharine substances, shows that, in the healthy person the sugar supplies one of the requisites of the organism; in the one having diabetes the sugar is eliminated with the urine, like a useless matter. The carbo-hydrates must necessarily pass through the vascular system in the form of sugar before passing through the urine. The examination of the urine which determines in it the presence of sugar, shows that the blood is also more or less loaded with it. In a healthy person the mode of nutrition exerts no influence on the composition of the blood and the urine; but, if from any cause whatever, the sugar appears in the general circulation it is certainly found in the urine. The first thing to be observed, in order to prevent the glycosuria, is to prevent the appearance of the sugar in the general circulation. This is what the healthy system does by the act of assimilation, accompanied with the transformation of fats and the synthesis of an albuminous glycoside. The alimentary form (light) of diabetes is the result of defective assimilation. The degree of the changes varies with the gravity of the case. The treatment ought to be directed to the restoration of the assimilating force of the organism, which is effected in proportion to the quantity of carbo-hydrates that can be taken into the system without being followed by the excretion of sugar in the urine. When this result has been obtained the organism requires a quantity of sugar in the nourishment of the system in proportion to what it can utilize, and if the requirements are not satisfied there is a falling off of both strength and weight. The supply of saccharine matter ought necessarily to be in proportion and subordinate

the power of assimilation, in other words, it should never be sufficient in quantity to cause the appearance of sugar in the urine. he effects on the system of a diabetic diet is very injurious and ›ove all things to be avoided. The principal point to be observed . the treatment is to keep the urine free from sugar and to try to ılance the supply and the waste in the system. The diabetes must ɛ attributed to the abnormal quantity of sugar in the blood. In ıe severe form of diabetes that attacks the young, along with the ıgar arising from the defect of the assimilation of the carbo-hyrates in the process of nutrition is found also the sugar produced y the defect of the process of organization of the albuminous glyɔcides of the body.

In a patient suffering with erysipelas and suppurating gland, esides a cystitis which dated back indefinitely, the urine showed a ɔecific gravity 10.40°, sugar, about 2½ grains to the ounce, no lbumen; ten grains of protonuclein and peptenzime were given ıree times a day. Urine examined after fifteen days, specific ravity 10.32; two weeks later, specific gravity 10.24; quantity ow five pints sp. gravity 10.10. Messrs. Reed and Carnrick claim hat peptinzime if not a specific has some influence on the reduction f sugar.

Chronic Nephritis.—M. le Dr. Crocq, of Brussels, presented o the Congrès International de Médecine, the subject of Chronic 'arenchymatous and Interstitial Nephritis. Le Progrès Médical, .th of September:

The author sees in the desquamation of the epithelial elements ›f the kidneys the necessary cause of albuminuria. That is why ›hysiological albuminuria cannot exist; but the cause of albumin-ıria may be transient. There may be, for instance, simply an ıctive or a passive congestion, as the rhenal congestions due to val-ɾular lesions of the heart. However, it is generally the parenchymatous inflammation that causes albuminuria. Interstitial nephriis is entirely distinct from this; this latter is due to the inflammaion of the conjunctive tissue of the kidney in which the parenchymatous elements are included.

If the epithelium, notwithstanding this, remains intact, there will ɔe no albuminuria; but if the inflammation extends to the epithelal elements, the albumen appears. There is then, in a clinical ›oint of view, two kinds of chronic nephritis; the former with albumen, the latter without albumen. These two kinds correspond with the two forms of parenchymatous and interstitial nephritis.

The different causes that lead the nephritis to one or the other of these kinds are: For instance cantharadine brings on parenchymatous inflammation; beer may have a similar influence; distilled liquor, lead, acids in the urine generally, cause an interstitial inflammation.

PATHOLOGY OF CHRONIC NEPHRITIS.—M. le Dr. Senator of Berlin reports: It is customary, although a grave error, to designate by the name chronic nephritis, an inflammation of both kidneys, an inflammation which is a consequence of changes in the blood, and which is consequently followed by a diminution of the rhenal parenchyna and atrophy of the kidney. A great number of cases of chronic nephritis have an arterio-schlerosis for their orign. The principal causes of this latter affection which destroys the parenchyma of the kidney are: gout, saturnization, the abuse of alcohol, syphilis, diabetes mellitus, tobacco and finally heredity. It is proper also to mention the chronic nephritis of old age which is caused by a want of sufficient irrigation of the kidneys and that arising from anemia.

M. le Dr. Jauvein, of St. Petersburg, remarked: The continued development of nephritis after the cessation of the cause, may be explained by the fact that the healthy parenchyma of the kidneys are not sufficient to remove the poisonous matter from the blood, so that the elements not assimilated exert a continued injurious action on the kidneys.

M. le Dr. Gerhardt, of Berlin. Clinical medicine is not so much interested in the pathological anatomy of nephritis as in its etiology. It appears more frequently and yet it is often neglected; sometimes months may pass before the appearance of albumen. Arterio-schlerosis is a frequent cause of disease in the kidneys at an early age. Primary contraction of the kidneys acts as a poison like alcohol, uric acid, etc. Scarlatina and pregnancy cause this only when other conditions are present. Uremia acts as a special poison, almost to the exclusion of all other forms of nephritis. In one case M. Gerhardt made a punctured opening in the lumbar region without benefit; a proof that blood pressure is not a cause.

M. Ewald, of Berlin, mentions the occasional appearance of albumen in the urine of children who apparently enjoy good health, and suffer only from dyspepsia. The albumen lasts only a few days. Ewald has not yet had an opportunity to determine whether this condition causes nephritis or not.

BLEEDING IN THE TREATMENT OF UREMIA.—M. le Dr. Laache, of Christiania, reported three cases of uremia treated with bleeding with very satisfactory results. The patients passed urine freely soon after the operation. The author did not use the injection of a solution of sodium into the blood after the bleeding. It is necessary to bleed freely in order to produce an influence on the whole circulation. But it is also necessary to consider the general condition of the patient. A large puncture over the seat of the disease has nearly the same influence on the secretion of urine; the analogy is evident.

M. le Dr. Friedel Pick, of Prague, has treated four cases of uremia by bleeding, but at the same time he injected the bromide of sodium into the rectum. He treated four other cases simply by injecting the bromide of sodium.

Mr. le Dr. Pisek, of Lemberg, thinks it necessary not to lose sight of the fact that this method of treating the disease is applicable only in some particular cases.

In refence to Dr. Ewald's cases the following may be cited:

On August 6th, Mrs. M., 22 years of age, gave birth to a very delicate female child, her second, at term. Her first is a female child of seven months gestation, now living and healthy. Mother was uremic, but as far as could be determined was in a good condition after delivery. Six hours after birth, summoned in great haste and found the woman in convulsions from which she did not recover consciousness.

Oedema of the lungs made rapid progress and she died about five hours later.

October 8th, called to see the child; found feet and hands odematous, extremely emaciated, urine suppressed. October 11th, child died in convulsions.

X RAYS.—M. le Dr. G. Apostoli presented to the Medical Congress at Moscow, the history of a very severe and obstinate case of dermatitis, with neuritis, following two applications of the X rays:

Extensive sphacelus of abdomen which, in February last, measured 17.7 centimeters by 13.6, caused by Roentgen rays applied in Dublin the 22nd and 28th of May, 1896.

The first application of the rays lasted 40 minutes, the Crook's tube 15 centimeters from the skin; the second, 90 minutes, the tube distant 9 centimeters. Nausea followed each application, but without vomiting; two days later a progressive erythema, which be-

came extremely severe. The following are the conclusions of the author:

1st. Radiography may cause, in certain circumstances, a *dermatitis* with *neuritis* more or less severe, characterized by a simple erythema or by an eschar more or less extending to the sub-cutaneous cellular tissue.

2d. This dermatitis varies according to its situation as on the skin, the nails, the hair, varies also according to the constitutional condition of the subject, and resembles in many respects an ordinary electric burn with the same general characteristics, asepsia, apyrexia and very slow tendency to recovery.

3d. This dermatitis is always the result of some error in the application, especially in placing the tube too near the skin, in continuing each application too long, or in making them too often or in fine too many of them.

4th. From the experience of MM. Destat, Balthazard and Tarchanoff, the injury is not due directly to the X rays, which are in themselves harmless, but to the *effluves electriques* caused by the tube. It becomes necessary to suppress these or to intercept them with a sheet of aluminum connected with the ground, which will allow the X rays to pass and arrests the dangerous electric rays.

5th. I propose as an effective treatment of this dermatitis:

(*a*) A simple static application which, by its direct and local action, aided by its general influence, hastens the cicatrization of the ulcers.

(*b*) The application of a galvanic current or better, of an undulating current, to hasten the fall of the eschar.

(*c*) The action of a very rapid current to increase the general nutrition and the strength of the system.

FOR DISORDERS OF THE GENITO-URINARY TRACT.—Dr. John Aulde, of Philadelphia ("Medical Times and Register" of Philadelphia, Pa., Dec. 5, 1896), invites special attention to the value of Peroxide of Hydrogen. He believes Hydrozone to be the best remedy for cystitis occurring either in the male or female. The bladder should be washed out with the solution (one to eight) a small quantity being used at first in chronic cases, owing to the painful muscular contractions following the withdrawal of the solution. The amount can be gradually increased. (A double current hard rubber catheter should always be used for that purpose). In gonorrhoea, gleet, and cystitis, the local treatment is oftentimes aided by the internal administration of hourly doses of calcium sulphide one-tenth of a grain.

"WHEELER'S TISSUE PHOSPHATES."—(Bone-Calcium Phosphate ı³, 2 PO⁴, Sodium Phosphate Na², HPO⁴, Ferrous Phosphate ³, 2 PO⁴, Trihydrogen Phosphate H³, PO⁴. Active Principles Calisaya and Wild Cherry.) "This" says Prof. Geo. F. Fenck, M. D., McGill University (Canada Medical and Surgical urnal), "elegant prepartion is a most palatable and agreeable rdial. We have used it with the most marked benefit in several ses of general debility. It is prepared under the superintendence Dr. Wheeler; the Phosphates being from the formula of Dr. usart, of Paris."

CREOSOTAL.—*Creosote* is admittedly the most active agent that e possess to combat tuberculosis, but its causticity prevents its hibition save in very small doses. By the union of carbonic acid ith creosote there is produced a body neutral in reaction, bland ıd oily to the taste, odorless, entirely without irritant effects upon e mucosae, and which can be absorbed in large dose without in ıy way deranging the stomach. This new compound called reosotal, is as active, weight for weight, as creosote itself; which readily conceivable, as nine-tenths of its mass is composed of that ıbstance.

Creosotal is a viscid liquid at ordinary temperatures, becoming ore fluid under the influence of moderate heat. Its color is amr, like that of the creosote from which it is derived; it has no lor when pure, hardly smelling of creosote at all.

It interferes in no way with the digestive functions, and is abrbed in large doses, 10, 15 or 20 grams (1-3, 1-2, or 2-3 ounces) ıily, without trouble.—Prof. Dujardin-Beaumetz, from Dictionre de Therdapeutique.

ON EDUCATION.—Mrs. Partington, after listening to the reading an advertisement for a young ladies' boarding school, said:

"For my part, I can't deceive what on airth eddication is coming :. When I was young, if a girl only understood the rules of disaction, provision, multiplying, replenishing, and the common domator, and knew all about the rivers and their obituaries, the covenıts and domitories, the provinces and the umpires, they had eddiıtion enough. But now they are to study bottomy, algierbay, and ıve to demonstrate supposition of sycophants of circuses, tangents ıd Diogenes and parallelogramy, to say nothing about the oxides, rostics, and abstruse triangles!" Thus saying, the old lady aned back in her chair, her knitting work fell in her lap, and for me minutes she seemed in meditation.

EDITOR'S TABLE.

SANITARIAN, NOVEMBER NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE BANE OF PRACTICAL SANITATION.

In so far as quarantines stand in the way of practical sanitation, or restrict people to infected places, they are dangerous to the community where they obtain and a source of danger to other communities. That the quarantines in operation on the Gulf Coast of the United States, at the time of this writing, are of this character is apparent to all persons who have practical knowledge of the conditions common to infectious and epidemic diseases, and particularly with reference to yellow fever. Such quarantines are the outcome of the still lingering credulity of the ancients who were wont to believe that epidemic diseases were visitations from external sources, regardless of local conditions. Nor indeed is this belief by any means limited to those communities who, in default of attention to local conditions and organized methods by those on whom they have placed reliance, resort to shot guns as a means of defense against the invasion of an enemy whose means of support they have assiduously cultivated. Some there are indeed, or at least have been, in positions of the highest influence in shaping our laws for the prevention of disease, who have encouraged, and continue to encourage the belief in the exotic origin of infectious diseases to such a degree as to be a constant source of danger to the public health by diverting the attention of communities from local conditions promotive of such diseases. For example: The editor of the Journal of the American Medical Association (September 11th), after referring to the premonitory fever that had prevailed at Ocean Springs for the two previous months, says: "As usual the initial cases were termed cases of dengue, and the suspicions of the public, if any existed, were allayed, but 'yellow jack,' like murder, 'will out.' Yet (September 18th) he comforts himself with the reflection that: "In this connection it will be recalled that Congress some years ago directed the removal of the National Quarantine from Ship Island to Chandelieur Island, in order to prevent epidemics of this character on the recommendation of Surgeon-General Hamilton."

Quite true. And the citation recalls besides, many other acts of the whilom Surgeon-General, as unjustifiable by practical knowledge of yellow fever, as is this insinuation of the responsibility of his successor in office for the occurrence of yellow fever at Ocean Springs.

But nothing is further from our purpose than to review the unsanitary service of Dr. Hamilton, on this occasion. He has proved himself expert in law making on the subject of quarantine under trying circumstances. As the laws now exist, with the additions that have been made to them since he retired from office, we have no fault to find with their scope as defined in the concluding paragraph of Surgeon-General Wyman's paper, on other pages of this number.

Indeed it appears quite clear to us that the outbreak of the present epidemic of yellow fever was in no respect due to the lack of legislation, either National or State, for the prevention of epidemic diseases, nor to any lack of vigilance or neglect of duty under the national health laws. Legislation has been all sufficient for the occasion, but the fault is and has been the lack of organized effort by those who are entrusted with their execution, severally and jointly. Not one of our State Boards of Health is lacking in law—indeed, for the most part, the laws make it the duty of the State Boards of Health to organize and supervise local boards of health, and empowers them to enforce preventive measures. But these boards have been so constantly jealous of their exclusive rights and privileges that any effort to exercise the national health laws, under the direction of the Surgeon-General of the Marine Hospital Service, without express invitation is more vigorously fought than the disease against which they should jointly contend.

Moreover, the State Boards have organized themselves into a National Conference, and they meet annually for the ostensible purpose of promoting preventive medicine. But on the subject of quarantine there appears to be no unity of either sentiment or effort, except it be in opposition to any interference by the Marine Hospital Service, lest as if the duties of that service were not, or could not be made helpful in the one primary object—the protection of the public health. The members—*all of them*—not merely the executive officers of the State Boards are supposed to possess that knowledge, and to *organize it.*

Organization implies coöperation, compactness and method, based on actual knowledge of conditions. Had there been such or-

ganizations in the Gulf States, this epidemic of yellow fever would not have occurred, and had a case been introduced from abroad, the disease would not have spread.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

YELLOW FEVER.

We have received no official reports from the Gulf localities, where yellow fever prevails, later than those published in our October number. But, summed up from correspondence and press reports to the date of this writing, October 20, there had been reported in—

LOUISIANA.—At New Orleans, up to October 16, 774 cases, with 83 deaths; under treatment, at that date, 339. At Franklin, Oct. 14, one case—fatal. Alexandria, "dengue" prevalent.

ALABAMA.—At Mobile, to October 15, 7 p. m., 152 cases, with 21 deaths; under treatment, 38. At Flomaton (Pensacola Junction, Mobile and Montgomery R. R.), 8 cases.

Wagar, Oct. 15.—Cases to date, 17—1 death.

Pleasant Valley, Oct. 16.—One case.

Montgomery Oct. 17.—Cases reported, under investigation. "As far as can be ascertained there have been 14 cases which have been acted on by the Board of Health under the suspicions of fever head."

Mississippi.—At Biloxi, to Oct. 14, 374 cases, 14 deaths; under treatment, 89. Berkley, to Sept. 18, 10 cases, 4 deaths. Edwards, to Sept. 30, 212 cases, 6 deaths. Ocean Springs, to Sept. 30, 23 cases, 6 deaths; but in both Ocean Springs and Edwards, the numbers are uncertain, on account of the long tolerance of "dengue" before the fever was recognized. Scranton, to Oct. 14, many; new cases, 10. Cayuga, Oct. 12, 6 cases. Pascagoula, Oct. 16, 6 cases. Bay St. Louis, Oct. 17, 7 cases.

Clinton, to Oct. 17, 13 cases, 1 death. Nita Yuma, to Oct. 16, 12 cases. Reported also at Alco, Hendersons Point, McHenry and Perkinston.

TEXAS.—Beaumont, Sept. 22, one case. Galveston, Oct. 9-11, 12 cases. Houston, Oct. 11, 3 cases.

Houston, Oct. 14. Dr. R. M. Swearingen, State Health Officer, last night, before he left for San Antonio, was requested to make a

statement for publication regarding the general situation. He reported that he did not think he could add anything to what had already been said on the subject of yellow fever. "When I brought Dr. Guiteras here," he said, "I apprehended that he would find the same condition here that he found in Galveston, and there is no doubt in my mind that yellow fever prevails in both Galveston and Houston. It is, however, of a remarkably mild form, and instead of being a calamity, I believe it is going to be a blessing. If the disease is stamped out, and it is found that there have been very few fatalities, as I believe will be done, it is going to result in a blessing to the community, and the name 'yellow fever' will have lost its horror."

When asked as to his opinion of the Government expert, he said: "This man Guiteras has done nothing but study yellow fever in all its forms and phases for the past fifteen or twenty years, and he has attained a proficiency that is absolutely marvellous. Little details in the symptoms of the disease, that would be scarcely noticeable to an ordinary physician, stand out prominently to him, and he will group together symptoms which the casual observer of ordinary medical men actually would not see. I have a very high opinion of his professional ability. It is purely and strictly professional; there is no personalism whatever about it. He is so intensely honest in his convictions and as sincere and positive as a man can be. No one has ever questioned my honesty, and I am more than willing to stake both my honor and professional reputation upon the accuracy and sincerity of Dr. Guiteras when it comes to diagnosis of yellow fever."

THE RATIO OF MORTALITY to cases of yellow fever, as summed up by the "Times-Democrat," has been: At New Orleans, 10.85 per cent.; at Mobile, 17.3 per cent.; at Biloxi 4.6 per cent., at Edwards 5.3 per cent., at Scranton 5.2 per cent. It is impossible to make any estimate for Ocean Springs, due to the doubt that exists about the first cases reported there, how many of them had yellow fever and how many only "dengue."

DENGUE AND YELLOW.—Houston, Tex., Oct. 15.—At a conference of a committee of physicians from the cities of Galveston and Houston, held to-day in Dr. D. F. Stuart's office in Houston, it was resolved:

"1. That, whereas, an unusual epidemic of dengue fever has prevailed in both cities and in other places of Central and Southern

Texas, and that certain cases in Galveston and Houston have presented unusual and conflicting symptoms, after a careful examination of such cases in both cities, we are of the opinion that the same character of disease is prevailing in both cities.

"2. That we further believe these cases, which are regarded as suspicious, to be analogous cases of dengue fever.

"3. That from certain cases which have came under our observation, coming from points in Central and Southern Texas, and from such information as we have derived from channels regarding the character of illness prevailing at other points in the Southern and Central portion of this State, we believe that the same disease is also prevalent in other towns and cities in Texas.

"4. We recognize that the close resemblance of the clinical history in certain forms of dengue and yellow fever make it most difficult to distinguish between the two diseases, and we would urge the importance of keeping under close surveillance and isolation all cases that may occur which present suspicious symptoms.

"5. We would further urge the importance of continuing strict and unrelaxed quarantine against all infected points.

"Dr. F. K. Fisher, Chairman; Dr. George H. Lee, Dr. C. H. Wilkinson, Dr. Clarence Warfield, Dr. J. E. Burke, Galveston. Dr. W. R. Eckhart, Dr. D. F. Stuart, Dr. S. C. Red, Dr. J. W. Scott, Dr. T. J. Boyles, Houston."

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrahams, M. D., Health officer.

CALIFORNIA.—C. A. Ruggles, M. D., President, Stockton; W. P. Matthews, M. D., Secretary, Sacramento.

San Francisco, 360,000. Report for August: Deaths, 422—97 under five years of age. From consumption, 50; acute pulmonary diseases, 49; from zymotic diseases, 29; diphtheria (and croup), 10; typhoid fever, 4. Annual death rate, 14.0. Contagious diseases reported during the month: Diphtheria, 23; scarlatina, 8.

Los Angeles, 103,000. Report for August: Deaths, 110. From phthisis, 19; acute pulmonary diseases, 3. Annual death rate, 12.93. "N. B.—Of the 19 deaths from pulmonary consumption, as follows: Natives of Los Angeles, 3; natives of the Pacific Coast outside of Los Angeles, 0; from other parts, 16. Of the 19 deaths 13 had lived here less than ten years."

COLORADO.—Denver, 160,000. William P. Munn, M. D.,

Health Commissioner, reports for August: Deaths, 131. Of these 29 were caused by consumption, 24 contracted elsewhere; 4 by acute pulmonary diseases. Annual death rate, 10.65 (excluding phthisis contracted elsewhere), 8.03.

Colorado Springs, 20,000. B. B. Glover, M. D., Health Officer, reports for September, 24 deaths, of which 8 were under five years of age. Annual death rate, 14.4 per 1,000. From typhoid fever, there were 2 deaths; from scarlatina, 1; from pneumonia, 3; from tuberculosis, 6.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven. The Secretary's bulletin for September comprises returns from every town in the State. There were 1,136 deaths reported during the month; 101 less than in August, and 8 less than the average number of deaths in September for the five years preceding the present.

The death rate was 14.9 for the large towns; for the small towns 16.6 and for the whole State 15.4. Deaths from zymotic diseases, 260, being 27.9 per cent. of the total mortality. From diphtheria, 22; typhoid fever, 31; whooping cough, 11; scarlatina, 3; cerebro-spinal fever, 8; malarial fever, 17.

DISTRICT OF COLUMBIA, 276,963—88,176 colored.—Wm. C. Woodward, M. D., Health Officer, reports the mortality for four weeks ending September 25, 431. Of the decedents, 246 were white and 185 colored, the death rate being 16.9 for the white, 27.2 for the colored, and 27.8 for the whole population. The principal causes of death were: Zymotic diseases, 112; constitutional, 90; 49 were from consumption and 12 were from pneumonia. Of the zymotic class there were 11 fatal cases of diphtheria, 18 of typhoid fever, and 15 of whooping cough.

GEORGIA.—We took occasion in October number to note and commend the act of the Atlanta Board of Health for placing no restriction against fugitives from the yellow-fever-infected localities on the Gulf Coast. Shortly thereafter, Miss Carrie Fleming, one of the fugitives from Mobile, who availed herself of the hospitality of Atlanta was taken with yellow fever. Having the courage of their convictions, the Board of Health made no secret of it. But there was at once a great hubbub raised by persons ignorant of the nature of yellow fever, and Atlanta was seriously threatened with quarantine by the authorities of some outlying localities who had

never learned that Atlanta was *enforcing* the most effective of all quarantine measures against yellow fever not only, but against all infectious diseases—*cleanlinsss.*

Nevertheless all sorts of rumors were set afloat, startling false reports were given credence and the backbone of the Board of Health was severely tested, but it stood the strain. Moreover, the Mayor stood by the Board, and proclaimed (Atlanta Journal, September 25):

"Except the case of Miss Carrie Fleming, the Mobile refugee, at 119 Auburn avenue, there is not a case of sickness of a suspicious nature in Atlanta. Any case of a suspicious character will be immediately made public for the benefit of people here as well as those living in other communities, and no case of yellow fever will be concealed from the public no matter whether the victim be a refugee or a citizen of Atlanta. The authorities are using every precaution and have no fears of an outbreak of fever here.

"C. A. COLLIER, Mayor."

Ye the representatives of Boards of Health and other authorities insisted upon a hearing. At the instance of Mayor Price, of Macon, who came to Atlanta with Dr. Barron, president of the Macon Board of Health, a special meeting of the Boa:d of Health was convened. There were present in addition to the members of the local Board of Health, Dr. Stone, representing Savannah; Dr. Foster, president of the Augusta Board of Health; Mayor Price and Dr. Barron, of Macon; Dr. Sawtelle, of the United States marine corps, and a number of prominent local railroad men.

The showing made was of such a nature that the representatives of both Macon and Augusta stated before the meeting adjourned, that they would advise those cities not to quarantine against Atlanta. Dr. Stone, of Savannah, stated his views on the situation here. He said the Atlanta authorities were taking all necessary precautions, having quarantined the house in which the only case in the city had been found. The restrictions thrown around Atlanta travelers by the local health board he thought a safeguard for other cities. He had advised Savannah, he said, not to quarantine against Atlanta.

Mayor Price and Dr. Barron, of Macon, spoke for their town, expressing themselves as highly pleased with what they had heard. They would advise their town, they said, not to quarantine against Atlanta.

Dr. Floyd McRae, secretary of the Atlanta Board of Health, at the request of Mayor Collier, told the visitors of the precautions being taken here, explaining in detail the method of issuing health certificates.

The visitors evidenced a lively interest in Dr. McRae's talk, and Dr. Foster and others questioned him closely. They were seemingly well satisfied with his replies. Several suggestions of value were made by Dr. Foster and others, and Dr. McRae said they would be adopted.

Dr. Olmsted, a yellow fever expert, who diagnosed the case of Carrie Fleming, was asked to make a statement and did so. He gave it as his belief that yellow fever could not spread in Atlanta. This belief, he said, was based upon past experience.

Mayor Collier assured the visitors that Atlanta had nothing whatever to hide, and that he and the Board of Health stood pledged to make public any and all developments in the fever situation here, regardless of how such disclosures might affect the city.

The mayor said Atlanta was the cleanest city in the country, and told how this state of cleanliness was brought about, and how it was maintained.

The one case of fever developing in a refugee, he said, caused not the slightest ripple of excitement in the city.

At the conclusion of the meeting the visiting officials expressed themselves as highly pleased with the facts which had been laid before them. There is no doubt that the meeting did much to promote a good feeling between the visitors and the local health board and to inspire confidence in the visitors.

It is to be hoped that the practical lesson of Atlanta will be profitable to other communities.

ILLINOIS.—L. Adelsberger, M. D., President, Waterloo; J. A. Egan, M. D., Secretary, Springfield.

At a meeting held October 5, it was decided that after May, 1901, no school of medicine or midwifery would be recognized unless its instruction was given in the English language. There are now no medical schools in the State teaching in a foreign tongue, but there are a number of schools of midwifery in Chicago that so teach.

After May 1, 1898, no candidate for license to practice medicine in the State will be examined unless he gives documentary evidence of a preliminary education equivalent to that of a high school course.

This applies especially to nongraduates in medicine who apply for license. Many of them who have successfully passed the medical examination are said to have been densely ignorant in common knowledge.

Chicago, 1,619,226. A. R. Reynolds, M. D., Commissioner, reports for September: Deaths, 1,679—683 under five years of age. From diphtheria, 53; typhoid fever, 48; consumption, 175; pneumonia, 67; bronchitis, 37; diarrhoeal diseases, 174. Annual death rate, 13.46.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

The State Board of Health reports for the last quarter in Indiana the total number of deaths 11,274 an annual death rate of seventeen per 1,000. Pulmonary consumption caused 1,680, pneumonia 790, diphtheria 303, scarlet fever 45, typhoid fever 201, measles 87. A severe epidemic of dysentery has visited about one-half of the State.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board Bulletin for July, reports since preceding: Diphtheria, 9 localities; scarlatina in 2.

Davenport, 35,000. W. L. Allen, M. D., Physician to Board of Health, reports for August 43 deaths—12 under five years of age. Zymotic diseases caused 10 deaths; consumption, 4.

KANSAS.—E. M. Hoover, M. D., President, Halstead; H. Z. Gill, M. D., LL. D., Secretary, Pittsburg. Other members: F. Cole, M. D., Garden City; M. F. Trivett, M. D., Eskridge; F. W. Plehn, M. D., Blue Rapids; A. E. Focht, M. D., Madison; A. M. Eidson, M. D., Topeka; J. W. Jenney, M. D., Salina; G. Bohrer, M. D., Chase; E. B. LaFevre, A.M., M. D., Chemist and Microscopist, Abilene.

The Board has recently issued a circular urging the attention of the local authorities throughout the State to the importance of a pure water supply for the prevention of typhoid fever. Also to some other sources of infection besides polluted water.

Soiled clothing of the sick with typhoid. Laundresses are more likely to be infected than nurses of the hospital. The sputa in a case accompanied by pneumonia or bronchitis may poison the air of a sick-room; or an ill-ventilated room or ward, in which one or more

ases may be confined, it is believed, can be so contaminated by oncentration of the poison as to affect attendants or other persons. Milk is not an uncommon medium by which the disease is spread. We believe it possible for the disease to arise spontaneously, that is, ithout any other known case, as in the opening of some old well r cess-pool into which filth of whatever kind has been thrown and llowed to accumulate. But this may not be, in a strict sense, an xample of the disease arising *de novo*. The origin is not always scertainable, any more so than it is in many other infectious diseases. There are a few well-authenticated cases of infection from iseased meat, the animals having been known to be in an unealthy condition when slaughtered.

Topeka, 35,000. "It is estimated (Capital), that there are at least ,500 head of swine raised and maintained within the city limits. here are many people who promise to keep their pens clean. But hat is almost an impossibility this kind of weather. The smell hich arises from a hog pen breeds disease. This is the edict which as gone forth from the city Board of Health. That board is composed of Doctors W. S. Lindsay, L. Y. Grubbs and M. R. Mitchell, Dr. Mitchell as city physician, and secretary of the board. If people must raise hogs, they will have to move their pens outside of he city limits."

Leavenworth.—Diphtheria and scarlet fever are prevalent in eavenworth at the present time (Standard, Sept. 24), and there is ear that the epidemic will become general.

Medical authorities tell us that diphtheria and similar contagions enerally arise from impure water and neglected sanitation; and hese conditions comprise many things. A rank growth of weeds nd foul and stagnant ponds are in the list.

Mayor Edmond has issued a proclamation in the interest of a eneral cleaning up and a sharp improvement in the sanitary conlition of the city. He calls attention to the ordinance making it bligatory on property owners to keep their several premises, s well as the adjacent streets and alleys, in good sanitary condition, nd free from weeds and other perishable incumbrances. This ordinance, the mayor warns the people by proclamation, will be vigrously enforced.

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; ohn N. McCormick, M. D., Secretary, Bowling Green.

Louisville (Courier-Journal), October 1: When yellow fever

first broke out Louisville was the first city to invite the refugees to a place of safety, and the States which were most in need of just such assistance have reciprocated by laying an embargo on all goods from Louisville! Speaking of the matter Dr. J. M. Matthews, president of the State Board of Health, said:

"It almost makes one weary of well-doing to read the reports from the South of a quarantine against the city of Louisville, in several States.

The truth is that Kentucky is the only State in the Union to open her doors to the South and invite all to come to her borders, where they would be welcome.

"Louisville alone has erected a yellow fever hospital and the extra expense will be enough to run the cost up to several thousand. The State of Kentucky is also at a considerable expense, and you must understand that it is not for our own protection, for there is no danger, but for the care and comfort of the Southern people.

"Now, what do we get in exchange for this hospitable conduct? Why, Texas, Arkansas and Mississippi quarantine against Louisville. The latter State through its State Board of Health says this action is taken because we have refused to quarantine against the South. Does this not sound strange, to quarantine against Kentucky, because Kentucky did not quarantine against her? All this is so ridiculous and absurd that if it was not serious it would be laughable.

"Please say for me officially that there is no yellow fever in Kentucky and that there will be none. One or two patients came here from the South a few weeks ago and had the disease. Nobody was concerned about them, save to protect the sick ones. I must confess that the State Board of Health feels a little aggrieved at such action as has been taken, and there is much grumbling among the wholesale merchants. Anyway, say again that Kentucky never quarantines."

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M.D., ealth Commissioner, reports for August. The weather: The ean barometric pressure during August was 29.99 inches; mean mperature 70°; total precipitation 4.71 inches, an excess in pre- ›itation during the month of 0.79 inches; prevailing direction of nd northwest.

Mortality for the month 914, a decrease of 8 compared with the rresponding month of August, 1896. Of these 714 were whites d 200 colored; a death rate of 19.87 per 1,000 for the former and .00 per 1,000 for the latter. The death rate per 1,000 for the ıole population was 21.67. 66 died from infectious diseases, 87 ›m consumption, 19 from pneumonia, 9 from enteritis, 35 from ıterocolitis, 19 from Bright's disease, 89 from cholera infantum, from diarrhoea, 36 from typhoid fever, 39 from gastroenteritis, 1 ›m cholera morbus, 14 from bronchitis, 24 from nephritis, and 21 ›m dysentery. 420 or 45.96 per cent. of the total deaths were in ıildren under five years of age. 92 deaths occurred in public in- itutions, of which 21 were reported as non-residents. During e month of August 204 cases of infectious diseases were reported, ı increase of 15 compared with the preceding month.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cam- ·idge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 516,395. Samuel H. Durgin, M. D., Chairman of oard of Health.

During the month of August there were 1,000 deaths, of which ımber 440 were under five years of age. Annual death rate, 23.24 er 1,000. Deaths from diphtheria (and croup), 20; scarlatina, 6; phoid fever, 25; cerebro-spinal meningitis, 5; consumption, 84. ases reported: Diphtheria, 140; scarlatina, 81; measles, 48; ty- hoid fever, 101.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. aker, M.D., Secretary, Lansing.

The Secretary reports for the month of September, 1897, com- ared with the preceding month: Influenza, pleuritis, dysentery, nd cholera infantum increased in area of prevalence. Compared ith the average for September in the 11 years, 1886-1896, pleuri- s and influenza were more prevalent, and remittent fever, con- ımption and intermittent fever were less, and typhoid fever much ss prevalent. Including reports by regular observers and others, ›nsumption was reported present in Michigan in the month of

September, 1897, at 190 places; typhoid fever at 120 places; diphtheria at 65 places; scarlet fever at 39 places; measles at 28 places and whooping cough at 20 places.

Reports from all sources show consumption reported at 3 places less; typhoid fever at 64 places more; diphtheria at 26 places more; measles at 24 places less; scarlet fever at 11 places more and whooping cough at 3 places less in the month of September, 1897, than in the preceding month.

Vital Statistics.—Initial number, Monthly Bulletin of Vital Statistics, published by the Department of State, edited by Cressy L. Wilbur, M. D., Chief of Division of Vital Statistics, reports for the month of September, that over 2,061,616 of the total population of the State has been reported in time for this Bulletin, and the death rate based upon the September returns shows an increase in accuracy of about fifty per cent. as compared with the old system. The new law renders the prompt publication of the data possible at a time when they can be of immediate importance and practical use to the sanitary officers of the State, as well as of interest to the public. The total number of deaths for the month of September was 2,370, including 88 stillbirths; these should be deducted for comparison with reports which do not include stillbirths in deaths. The annual death rate corresponding to the returns for the month is 13.4 per 1,000 estimated population.

The Weather.—The average or normal temperature over Michigan during September as compiled from ten years' observations, is 59.9 degrees. The mean temperature prevailing during September, 1897, was 63.3 degrees or 3.4 degrees greater than the normal; the month averaged 6.9 degrees warmer than September, 1896, and is considerably warmer than any past September for ten years back, excepting those of 1891 and 1895 which were respectively 64.1 and 64.2 degrees. The highest temperature recorded was 100 degrees at Mottville, St. Joseph county, on September 9th. The lowest temperature was 20 degrees at Iron River, Iron County, on the 20th.

The average or normal precipitation over Michigan during September as compiled from ten years' records, is 2.84 inches. The average total which fell during September, 1897, is 1.30 or 1.54 inches less than the normal and is the driest September on record —the nearest approach being September, 1891, with 1.78 inches average monthly fall. One year ago the average total was 5.10

nches which is also the greatest September fall on record, thus ›ringing the two extremes of September precipitation during the ›ast eleven years immediately together.

During September, 1897, the precipitation was unevenly distrib-ıted, more rainfall occurring over the northern counties than the ›ther sections while the amount falling over the southern counties ıas exceedingly light, being less than 30 per cent. of the normal.

The dry month has consequently caused a less amount of cloudi-ıess which is evidenced by the fact that there were only an aver-ıge of 4 rainy days and that there were 19 clear days, 7 partly cloudy ınd only 4 cloudy days. C. F. SCHNEIDER, Director.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, reports ›or August: Total mortality, 423—203 under five years of age. An-ıual death rate per 1,000, 15.41. Consumption, 17; pneumonia, 11; diptheria, 10; scarlatina, 8. Cases reported: Diphtheria, 48; ›carlatina, 39.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602. H. N. Avery, M. D., Commissioner, re-›orts for August: Deaths, 164—80 under five years of age. Deaths: Consumption, 15; typhoid fever, 9. Annual death rate, 7.97.

St. Paul, 215,582. A. J. Stone, M. D., Commissioner. Mor-tality for August, 122—58 under five years of age. Deaths from diphtheria, 1; consumption, 18; pneumoia, 4. Annual death rate, 5.67.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Paul Paquin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for August: Deaths, 766—297 ınder five years of age; from zymotic diseases, 149; diphtheria, 8; whooping cough, 8; typhoid fever, 18; phthisis, 67; pneumonia, 25; diarrhoeal diseases, 79. Annual death rate, 15.3.

School sanitation (Republic, Sept. 24) is attracting deserved at-tention. Speaking of this all-important matter in his annual re-›ort, not yet published, Health Commissioner Starkloff says:

"Last fall I directed an examination to be made of the public, pri-vate and parochial schools of the city. Ninety-seven public and 88 private and parochial schools were examined. The air space of two-thirds of the schools was found to be insufficient; the amount of floor space, in many of the schools, was far below the requisite

allowance. In only about one-third of the schools were there good, modern methods of ventilation; the toilet arrangements in many were defective, and in some instances very bad. In many the light was bad, and in several the outside surroundings were objectionable. The provision for light is of great importance, and in many instances very little attention has been given to it. I am convinced from observations that a large percentage of cases of weak and impaired eyesight in children can be traced to improperly lighted schoolrooms, and experiments made in Germany disclose the fact that near-sightedness increases with the attendance at school."

Dr. Starkloff quoted from an article in THE SANITARIAN by Dr. C. R. Agnew as to the results of an investigation made in various schools of Cincinnati, New York and Brooklyn; also from the statistics compiled by Dr. Cohn of Breslau as to the increase of myopia among students.

This, with other testimony, shows the important bearing of light on the health of school children.

Kansas City, 175,000. E. Von Quast, M. D., Health Officer, reports for August: Deaths, 140—58 under five years of age. Deaths from typhoid fever, 2; phthisis, 4; tuberculosis, 10; pneumonia, 4. Annual death rate, 9.6.

Negro mortality. Dr. G. O. Coffin, City Physician, reports for the year ending with April last, that the births in the city numbered 2,431; of these 2,231 were white and 200 black. The deaths numbered 1,873, of which 1,550 were white and 323 were black. The remarkable feature of these figures is that while 681 more white persons were born than died during the year, there were 123 more deaths than births among the negroes. Considering that the negro population of Kansas City is less than ten per cent. of the whole population, these facts and figures are rendered even more remarkable. It scarcely ever happens, Dr. Coffin says, that the deaths among negroes do not exceed the births for any month in the year, and he attributes this excessive mortality largely to the prevalence of tuberculosis among the negroes. To this disease the mulattoes are much more susceptible than are blacks, and miscegination is regarded by him as one of the prime causes of weakened vitality of the race.

MONTANA.—Butte.—Dr. W. M. Shultz reports for the month of August, 48 deaths, a fraction under 10 per thousand. The report recommends that the public schools be thoroughly disinfected be-

fore they are opened in order to prevent the origin of any contagious disease. A significant feature in the death returns is that 23, or one-half of the mortality, occurred in infants under one year of age and many of these, bottle fed, being of very low vitality survived but a few days from the beginning of their sickness.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Paterson, 107,056. J. L. Leal, M. D., Health Officer, reports for August: 165 deaths—102 under five years of age. Annual death rate, 15.2. Deaths from diphtheria, 4; consumption, 14; pneumonia, 1.

Newark, 230,000. Health Officer Chandler reports for the four weeks ending September 25: Deaths, 255—126 under five years of age; from diphtheria, 7; consumption, 30; pneumonia, 13; other respiratory diseases, 12. Annual death rate, 15.7.

Hudson County (Jersey City and vicinity), 355,231.—W. W. Varick, M. D., President.

Asbury Park, 39,141—35,000 non-resident, 4,141 resident. N. E. Buchanon, President, D. C. Bowen, Clerk. Mortality report for the year ending October 1st, 1896: Total deaths 59, of which 25 were of non-residents. Death rates: Resident, 8.21; non-resident, 0.71. There were 7 deaths from consumption, 1 from measles and 1 from diphtheria.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for August states that the reported mortality is less than the average for this month and very much less than that of August, 1896, which was excessive, in part by reason of deaths from sunstroke which then caused 1,125 deaths against a very limited number this month. In the cities of New York and Brooklyn there were 1,750 fewer deaths than in the corresponding month of last year, and in the entire State 2,300 fewer. The number of deaths from all zymotic diseases was less by 650, from diarrhoea by 500, and from typhoid fever and whooping cough by 50 each. Deaths attributed to diseases of the nervous system and from old age and unclassified causes were less, these latter representing for the most part individuals of enfeebled vitality. The death rate for the month was 18.75 against 23.25. The decrease in infant mortality was not so marked, there having been 750 fewer deaths under the age of five years. Compared with the preceding

month of July, there were 1,100 fewer deaths from all causes, the decrease being almost entirely in the mortality of early life; from diarrhoeal diseases there were 1,800 deaths against 2,400, and there were fewer deaths from digestive, nervous and also respiratory diseases, as well as from accident and unclassified causes. Whooping cough shows an increase as is customary, August being uniformly the month of largest mortality from this cause. Typhoid fever, also as usual, has increased but not to the customary degree and no special prevalence has been reported from any locality. Scarlet fever has decreased, but two deaths being reported from it outside the maritime district, and measles also decreased to 40 deaths, three of the sanitary districts reporting no deaths from it. Diphtheria had the same mortality as in July and as in August of last year. Consumption caused the average mortality for the month, a little over 1,000 deaths. The average mean temperature was two degrees below the normal of 69°; the mean relative humidity of 74 per cent. was slightly excessive; the rain fall showed slight excess in some parts of the State but was generally about the average of 3.50 inches; west and south winds prevailed of moderate velocity, and half of the days were clear.

New York City, 1,995,000. Report for August: Deaths, 3,335—1,515 under five years of age. Death rate, 19.70. Zymotic diseases per 1,000 from all causes, 218.25; diphtheria, 94; typhoid fever, 40; cerebro-spinal fever, 11; consumption, 420; acute respiratory diseases, 290; diarrhoeal diseases, 505.

Brooklyn, 1,100,000. Report for August: Deaths, 1,890—950 under five years. Death rate, 20.20. From zymotic diseases, per 1,000, from all causes, 247.50; diphtheria, 72; typhoid fever, 20; consumption, 173; acute respiratory diseases, 130; diarrhoeal diseases, 328.

Buffalo, 360,000. Report for August: Deaths, 455—244 under five years. Death rate, 15.2. From diphtheria, 8; acute respiratory diseases, 17; consumption, 35; typhoid fever, 3.

Rochester, 170,000. Report for August: Deaths, 129—53 under five years. Death rate, 12.6. From consumption, 19; acute respiratory diseases, 4.

Albany, 100,000. Report for August: Deaths, 118—32 under five years. Death rate, 14.2. From typhoid fever, 9; diphtheria, 5; consumption, 13; acute lung diseases, 3.

Syracuse, 120,000. Report for August: Deaths, 175—82 under

five years of age. Death rate, 17.5. From diphtheria, 4; acute respiratory diseases, 7; consumption, 15.

NORTH CAROLINA.—George G. Thomas, M. D., President, Wilmington; Richard H. Lewis, M. D., Secretary, Raleigh.

The August Bulletin summarizes the mortality from twenty towns with an aggregate population of 102,734—44,767 colored.

Total number of deaths, 159—of which 107 were of colored people and 60 under five years of age. Typhoid fever caused 16 deaths; malarial fever, 15; whooping cough, 10; consumption, 28; pneumonia, 2; diarrhoeal diseases, 28. Annual death rates, whites, 10.8; colored, 28.7; total, 18.6.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cases of and deaths from infectious diseases reported to the State Board of Health during the four weeks ending September 25, 1897: Diphtheria, 191 cases, 28 deaths; scarlatina, 127 cases, 6 deaths; typhoid fever, 220 cases, 38 deaths; whooping cough, 75 cases, 7 deaths; measles, 20 cases, 0 deaths. Aggregate population represented, 1,354,189.

Cincinnati, 405,000. J. M. Withrow, M. D., Health Officer, reports for August, 419 deaths—133 under five years of age. Annual death rate, 12.41. From consumption, 42; pneumonia, 19; bronchitis, 8; zymotic diseases, 54; diphtheria, 7; typhoid fever, 9.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports for the month of August: Deaths, 477—253 under five years. From diphtheria, 3; typhoid fever, 12; consumption, 12; tuberculosis, 17; pneumonia, 14; bronchitis, 6. Death rate, 16.3.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,214,256. Theodore B. Stulb, Health Officer, reports for the four weeks ending September 28: Deaths, 1,501—562 under five years of age. From diphtheria, 73; typhoid fever, 31; consumption, 165; pneumonia, 77; cholera infantum, 99; scarlatina, 11. Annual death rate per 1,000, 12.4.

The Smoke Nuisance.—At the monthly meeting of the Franklin Institute, Sept. 15, the secretary read a communication from the actuary, submitting a report of the action of the Board, which was as follows:

"Whereas, The Board of Health of the city of Philadelphia has

requested the Franklin Institute to discuss the question of smoke prevention and to offer practical suggestions relative thereto, and

"Whereas, The use of bituminous coal for fuel is increasing in this city and is likely so to continue in the future, and

"Whereas, It appears from testimony presented to the Institute that it is practicable to burn bituminous coal in suitably constructed furnaces without creating a smoke nuisance; therefore, be it

"Resolved, That it is the opinion of the Institute that the continuous or frequent discharge of dense, black smoke from furnaces of stationary boilers is avoidable and should not be permitted within the city limits.

"Resolved, That the emission of smoke from locomotive furnaces other than those of stationary boilers might be greatly reduced if the co-operation of firemen and employers were enlisted with an earnest intention to abate the nuisance, and more especially if the railway companies could be induced to use anthracite coal or coke in the furnaces of the locomotives used for local service in the train yards within the city limits.

"Resolved, That a copy of these resolutions be sent to the Mayor, to the President of the Board of Health and to the Presidents of the City Councils."

The resolutions were unanimously adopted.

Next followed an inspection of improved furnaces and automatic stoking devices by which the production of smoke is prevented and greater economy is secured in the consumption of fuel. Invitation had been extended to manufacturers and inventors to attend the meeting, and the representatives of nine different devices were present and described their apparatus with lantern-slide illustrations. Certain features were common to them all, which had for their object the feeding of the coal upon the grate bars at a regular rate; the admittance of enough air, but no more, to consume the carbon so that no unconsumed carbon shall pass into the stack, and such a construction of the furnace as should utilize the heat, allowing as little as possible to be dissipated or to pass out of the stack. All the devices exhibited were good, and some were evidently better than others. Every one shown would unquestionably prevent any smoke from passing into the air. All are now in extensive use, as shown by the photographs of installations in Philadelphia and many other cities where they have been adopted as a means of economizing fuel. There seems to be no question,

therefore, that the means is at hand for abating the smoke nuisance, and that it is to the interest of steam boiler users to adopt some one of the devices now on the market.

Pittsburg, 285,000. Report for the four weeks ending September 25: Deaths, 370—176 under five years of age; typhoid fever, 22; consumption, 28; diphtheria, 7; diarrhoea, 39. Death rate, 16.6.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence.

Newport.—The Newport Sanitary Protective Association held its nineteenth annual meeting October 8th. The President, Mr. Jas. J. Van Alen, summarized the work of the Association for the year and reviewed the condition of the sanitary works of the city. An abiding subject of attention had been the question of continuing to discharge sewage into the inner harbor. The Association has almost annually insisted upon the vital importance of the waters of the harbor being protected from sewage defilement, and has shown that at numerous points along the water front, storm-water overflows, so called, have been constructed—especially from the main sewer—which are in reality but escape places for the scourings and foul deposits of the sewers themselves. The Association has, during the last year, received the co-operation of the New York Yacht Club in the exercise of its effort to do away with the sewage pollution of the harbor, and the club now stands pledged by its representatives to endeavor to prevent the entrance into the harbor of any sewage whatever, including that heretofore, and at present, introduced under the deceptive designation of overflow.

The local Board of Health during the year has shown an unusual desire to perform its duties, and for this, though no more than could reasonably have been asked of it, it deserves much praise. It has caused foul tenements that harbored contagious disease not only to be disinfected, but to be put in repair, and even more than this, it has had them vacated during the process. It has also taken a still more decided stand than ever before, regarding the necessity of cremating the public refuse, and it has also advised that the public school houses should be provided with proper sanitary arrangements, and it has protested against the scandalous manner in which the city garbage has been collected and nominally disposed of. In short, it clearly appears from this report that the city Board of Health continues to be handicapped by the obtuseness or purblindness of the Aldermen. The School Committee

long ago pointed out that the condition of several of the buildings under their care is such as to endanger the health and lives of the children attending them, the Aldermen, haggling at the cost of necessary improvement, propose halfway measures, which beside being insufficient, will, as always, prove themselves to be, in the end, more costly. Though the garbage question is an offense to the whole community, the Aldermen seriously contemplate continuing the present methods, and talk of a contract for five years longer. Things have come to a lamentable pass when a citizen of Newport (formerly President of this Association), Mr. William Binney, has been compelled to report to the Aldermen, on the sixth of this hot month of July, that the collectors of swill have in the past three weeks been to his house only once in one week, twice in another, and once since June 30th. A number of tenement houses and even of detached dwellings remain in a state of squalor perilous to the health of their neighborhood. As yet there are no public bath houses, though strongly advised by the Newport Medical Society, urged by His Honor the Mayor, and imperatively demanded by every consideration of decency, comfort and health. It is gratifying and encouraging to be able to supplement this report by acknowledgment that the city authorities have made commencement in this important undertaking.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending September 25: Deaths, 126—96 colored. Under five years of age, 39. Annual death rate—white, 13.5; colored, 34.8: 24.2.

Beaufort, September 16 (Charleston Courier): At a meeting of the Board of Health, held yesterday, it was resolved to quarantine against all yellow fever infected points reported and to enforce strict quarantine against Atlanta!

TENNESSEE.—J. A. Albright, M. D., President, Somerville; J. Berrien Lindsley, M. D., Secretary, Nashville.

No official reports. But Memphis (Simiter) Oct. 22: The health authorities of Memphis have come out in direct opposition to the authorities of the State Board in regard to the quarantine declared against the State of Mississippi. The following resolution was introduced and passed this morning at a meeting of the board:

"Resolved, That the quarantine ordered by the Tennessee State Board of Health, September 19, to take effect September 20, in-

cluding the entire State of Mississippi, is uncalled for, impracticable and injurious to the interests of Memphis; that the reasons for the order as given by Dr. J. A. Albright, president of the Tennessee State Board of Health, in his telegram of September 20, to Dr. G. B. Thornton, president of the city Board of Health, are not sufficient to justify this order. A question of punctillo between the State Board of Tennessee and the State Board of Mississippi should be settled without involving such serious consequences to Memphis and her business interests as would follow the enforcement of this order."

Dr. J. B. Thornton, President of the Board of Health, said that it was a well known fact that the quarantine order issued by the State Board had not been enforced in a single instance; that he had used his own discretion in regard to the quarantine regulations and had carried them out in a manner which he thought just and proper. On receiving the telegram from Nashville on Sunday night he at once wired back to Dr. Lindsley that he considered the order of the State Board of Health as uncalled for, impracticable and injurious to the business interests of Memphis, and demanded a reason for the issuance of such an order. He received later in the afternoon of September 20 the following telegram:

"Dr. G. B. Thornton, President, Memphis: The State Board of Health of Tennessee has not received the recognition or information from the State health authorities of Mississippi to which they were entitled and which the public health and interests of our State demands. Therefore the order of quarantine against Mississippi will be properly enforced until the present situation is changed or until published information and recognition are afforded the Tennessee State Board of Health to which it is entitled.

"J. A. Albright, President of the State Board of Health."

Dr. Thornton said that he protested against this order and wished to be on record as so protesting. It is impossible to carry out such an order without so seriously injuring the business interests of Memphis that the injury will be almost worse than the plague itself. The order, he said, had not been enforced and he did not intend to enforce it until he was called upon by the Mayor and city Board of Health to do so. He was acting under their authority for the interests of Memphis, and he would so continue to act until he was ordered to do otherwise. They have adopted, in carrying out the quarantine in this city, the rule of the United States Marine Hos-

pital service, and under these rules they think it impossible for any infection to be carried into this city.

Dr. Lindsley, Secretary of the State Board, who was present at the request of Dr. Thornton, said he was merely the executive officer of the State Board of Health, not even being a member of that body. All that he was authorized to do was to carry out the instructions given him by the State Board of Health. This he had done in transmitting the order to the Memphis authorities. On his return to Nashville (Nashville Banner), at a meeting of the State Board, Sept. 24, he explained the situation at Memphis, and, after some discussion, Dr. Albright, President of the Board, offered the following resolution, which was adopted:

"Whereas, In view of the very mild character of the yellow fever now prevailing in Mississippi, Louisiana and Alabama, coupled with near approach of cold weather and heavier frosts, and more especially in view of the system of quarantine now enforced against the districts infected with yellow fever by the United States Marine Hospital Service; therefore,

"Resolved, That all former quarantine orders of this board be, and are hereby rescinded, and that the following order be in full force and effect, to-wit: No person, persons or baggage shall be permitted to enter and remain in Tennessee from New Orleans and vicinity; nor from Mobile and vicinity; nor from Biloxi or other points on the Gulf coast, between New Orleans and Mobile; nor from Edwards or other points in Mississippi, which are or may hereafter become infected, unless said person or persons, including all baggage, shall strictly comply with the following regulations of the State Board of Health of Tennessee:

"Person, persons or baggage from the above quarantined districts who desire to remain in the State may do so in East Tennessee and in Middle Tennessee, and all such persons, together with baggage, heretofore indicated, who may desire to remain in the portions of Tennessee as indicated above shall obligate themselves to remain in the said sections of the State for the period of ten days from the date of their arrival at their respective destination under the surveillance of this board, before going into the excepted territory of this State, which includes all territory west of the Tennessee River."

Dr. McMurray offered the following resolution, which was adopted:

"Resolved, That health certificates will not be required of per-

s traveling from point to point within the State, but all persons n without the State, who may desire to enter and remain in what nown as West Tennessee, shall be required to present a health ificate, properly stamped, as heretofore indicated. West Ten- e shall comprise territory west of the Tennessee River."

ashville (American) Sept. 8: A called meeting of the Chamber ommerce was held last night at their headquarters, the object he meeting being to consider the yellow fever question in its tion to Nashville. After rehearsing and endorsing the resolu- s of the State Board on the 24th inst., as above, added:

Therefore, be it resolved, by the Chamber of Commerce, that we hasize the declaration of the State Board of Health and pro- n after due deliberation and a full conference with distin- hed and prominent members of the medical profession of this , that no fear whatever exists in Nashville, Tenn., from yellow r; that it is a well-known fact that yellow fever never existed Jashville, and that in 1878, when the yellow fever prevailed in South, Nashville threw wide open her gateways and the fever er spread.

Therefore, be it further resolved, that Nashville extends a cor- invitation to all visitors to our Centennial and all merchants ring to visit our city who shall come from outside of infected icts, as prescribed by our Board of Health, guaranteeing olute safety in Nashville.

ASHINGTON.—Seattle, 60,000.—R. M. Eames, M. D., Health cer, reports for August, 31 deaths. Annual death rate per o, 7.4. Deaths from consumption, 6; pneumonia, 4.

ISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. 3. Wingate, M. D., Secretary, Milwaukee.

ilwaukee, 275,000. Walter Kempster, M. D., Commissioner lealth, reports for August: Deaths, 342—97 under five years of Annual death rate per 1,000, 14.9. Diphtheria caused 3 hs; consumption, 22; acute respiratory diseases, 19.

lean Streets and Public Health.—From "Wisconsin," Sept. 16. he sanitary efficacy of cleanliness does not require a cholera epi- ic or a yellow fever scare to proclaim itself to people who think. re are many diseases which are present in every large com- ity all the year round, and which thrive on filth, giving way re the onslaught of well-regulated health boards. Impressive stics come from New York. The president of the New York

Board of Health reports that the cleaner streets of that city have reduced the death rate from 27.3 per thousand in 1893 to 20.2 in 1897. The last State census reported New York as a city of 1,800,000 inhabitants. On that basis, the improved cleanliness of the streets is saving the lives of 12,000 people per year.

What consternation there would be if yellow fever should cause 12,000 deaths in New Orleans. The whole world would shiver at the thought. Yet until improved street-cleaning methods were adopted in New York, five years ago, unnecessary deaths at that rate occurred every year, and no one but a few medical experts gave a thought to it.

Milwaukee, which has been exerting herself in behalf of clean streets, for several years, with noteworthy effect, is now striving for another sanitary reform—the prompt removal and disposal of garbage. Hundreds of lives will be saved every year by the proposed improvement of the city's sanitation. The people who look at the problem solely from the sordid standpoint of dollars and cents miss its most important aspect. Yet the likelihood is that the proposed reform will save money as well as human lives.

THE NEW SURGEON-GENERAL.—Just as this number is sent to press the announcement is made that Medical Director WM. K. VAN REYPEN has been appointed Surgeon-General U. S. Navy, to fill the vacancy created by the death of Dr. Bates.

OBITUARY.

NEWTON L. BATES, Surgeon-General U. S. Navy, died in Washington, October 18th, 1897. He was appointed Surgeon-General about two weeks before his death, to succeed Surgeon-General Tryon, and was obliged, on account of the illness which finally resulted fatally, to take the oath of office in bed. His illness at that time was not regarded as serious, but developed alarming symptoms soon thereafter.

Surgeon-General Bates entered the navy from New York State, in June, 1861. In 1863 he was assigned to the Mississippi squadron. From 1864 to 1867 he served at the New York Naval Laboratory, after which he rendered service at sea, being sucessively attached to the Portsmouth, the Swatara, the Miantonomah, and the Pawnee. Later he was fleet surgeon of the South Atlantic station, from 1873

1876, and subsequently of the European station. Prior to his ›pointment as Surgeon-General he was a medical director, with e relative rank of Captain, and was on duty at the Naval Museum Hygiene. Surgeon-General Bates leaves a wife, the daughter Medical Director Bache of the navy, deceased; she was with him the time of his death.

WILLIAM DU BOSE BRATTON, Passed Assistant Surgeon, U. S. :arine Hospital Service, died at Sabine Pass, Texas, October 2, 97. He was born in Fairfield County, South Carolina, June 23, 60, the son of General John Bratton of Winnsboro, in that State. e was a graduate of the University of the South at Sewanee, Ten- :ssee, where he received degree of B. S. in 1880, and gradu- ed at the Medical College of South Carolina, March 1, 1884.

He was commissioned as Assistant Surgeon, April 1, 1885, and as kept on active service until the fall of 1893, when he first be- me aware of a condition of his health which gradually disclosed a berculous character, and after the Bureau had been officially in- rmed of it, he was sent to Wilmington, N. C., for its favorable imate, where he remained several months, doing meanwhile tem- ›rary service at Delaware Breakwater Quarantine, but later he as placed on "waiting orders" (January 1, 1895), taking up his sidence in Arizona, and finally at Albuquerque, New Mexico, to ›tain the advantages of the southwestern arid region. After a ·o years residence there he reported, in March, 1897, his gradual turn to a state of health, which justified him in asking for an early storation to active duty, but further delay was advised in order at he might have the benefit of a longer residence and, if possible, permanent cure. During the period of "waiting orders" he be- me much interested in the climatic treatment of consumptives, ıd wrote several reports on the arid region of the Southwest as the :st locality for such work, recommending the establishment of a nitarium in that section for the treatment of patients of the Ma- ne Hospital Service suffering from the disease.

His literary and scientific attainments were of a high order, and s studious habits and keen faculties enabled him to maintain in e Service a reputation for unusual professional knowledge and :ill in practice. Officially, devotion to duty was always a para- ount consideration with him, and his conscientiousness in respect ıereto was a marked characteristic of his work. He was in every :spect a noble officer.

BOOK REVIEWS.

TYPHOID FEVER AND ITS ABORTIVE TREATMENT. By JOHN ELIOT WOODBRIDGE, M. D., late Vice-President Ohio State Medical Society. In one volume of 368 pages. The Cleveland Medical Publishing Co., Cleveland, Ohio.

The author of this book seeks to establish as a fact that typhoid fever can be aborted; to offer such suggestions as will enable physicians to so apply the principles of antiseptic medicine to the treatment of typhoid fever patients that they may assure them a minimum of suffering and duration of illness and the greatest possibility of recovery; and finally, to demonstrate the enormity of the crime which is committed by communities that pour their sewage into the lakes and rivers from which they derive their water supply.

THE ELECTRO-THERAPEUTIC GUIDE. By WILLIAM F. HOWE, M. D., Ph.D., President of the National College of Electro-Therapeutics; editor of the Electro-Therapeutist. Third edition, pages 49. Published by the author. Indianapolis, Ind.

This little work is intended to assist the general practitioner in the application of electricity in disease and to guide him to results which, without such guidance might result in failures. It has not been written for the specialist, nor is it intended to take the place of standard works.

Physicians who are not thoroughly posted on this subject, may by the aid of this guide, be enabled to apply electricity in a scientific and successful manner.

AN EPITOME OF THE HISTORY OF MEDICINE. By ROSWELL PARK, A. M., M. D., Professor of Surgery in the Medical Department of the University of Buffalo, etc. Illustrated with portraits and other engravings. One volume, royal octavo, pages xiv—348. Extra cloth. Beveled edges, $2.00 net. The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street, Philadelphia; 117 W. Forty-second street, New York; 9 Lakeside Building, Chicago.

This book is the elaboration of a series of lectures given in the Medical Department of the University of Buffalo, and presents the most important facts and events comprised within the history of medicine, in such a manner as to be useful and acceptable to the interested laymen as well as to the members of the medical profession.

The author indicates the relationship which has always existed between medicine, philosophy, natural science, theology, and even *belles-lettres*. Particularly he says is the history of medicine inseparable from a consideration of the notions and beliefs which at times have shaken the very foundation of Christendom and the Church, and for reasons which are made clear throughout the book. Special consideration has been given the causes which have conspired against the more rapid development of the art of medicine, amongst which, the forbidding attitude of the Church figures most prominently. Altogether it is a valuable contribution to medical literature.

REPORT OF THE COMMISSIONER OF EDUCATION, for the year ending June 30, 1896. Vol. I. 1,040 ages.

This volume is of inestimable value to superintendents of schools, boards of education, teachers, and all citizens who desire to be posted on the status of education in the United States and foreign countries. It contains reports and statements in detail in regard to enrollment in schools and colleges; common schools; average amount of schooling per inhabitant; city school systems and supervision; constitution and powers of school boards; secondary schools; normal schools; higher education; education of the colored race; public society and school libraries; school revenue; salaries; education in Great Britain, Germany, Austria, France, Switzerland, Mexico and Central America; music in German schools; the American common school in New York, New Jersey, and Pennsylvania during the first half century of the Republic; the American common school in the Southern States during the first half century of the Republic; the Jewish primer as it was used in the public schools two thousand years ago, and other elaborate reports, charts and statistics.

ALCOHOLISM is the title of a brochure of about one hundred pages, comprehending a number of letters and prescriptions from high authorities, in evidence of the utility and excellence of "Fellows' Syrup of Hypophosphites," as a remedy of great value in the treatment of alcoholic breakdowns—the treatment of that phase of alcoholism that commonly follows the disuse of alcohol and requires an up-building, nutritive tonic that will fortify the tissues and strengthen the power of resistence against a return to the vice of intemperance. New York, 48 Vesey street; Paris, 5 Rue de le Paix; London, Jas. L. Fellows, 56 Holborn Viaduct, E. C.

CONTEMPORARY LITERATURE.

UNPAID SCAVENGERS.

The crustaceans are among the important scavengers of the sea and are also valuable as food for fishes. The collection of crabs, shrimps, and lobsters forms large industries all over the world, contributing directly to the support of man. In Delaware the horse-shoe crab is used as guano, while the collection of fossil crabs, as trilobites, is a peculiar industry. The fresh-water cray-fish produces a concretion used as an antacid, well known to chemists. We owe many of the beauties of our summer fields to insects, all of which have their special functions and use. Even the persecuted flea may render man a service by keeping the drowsy watch dog awake, while the mosquito in tropical countries may aid in preventing the human inhabitants from living a continual *sicsta*.

The flies are among the most valuable insect scavengers. The spiders prey upon flies, holding them in check. The silk of the spider is used as a cross line in astronomical instruments, and that of a Bermuda species as sewing silk. Bridge makers have obtained valuable suggestions from these silent workers, from whose web one of the kings of France is said to have made a coat. Grasshoppers and locusts are enemies of civilized man, but are eaten by the Indians, while in the Malay country the dragon fly is considered a delicacy.—From "The Economic Value of Animals," by C. F. Holder, in Appleton's Popular Science Monthly for October.

How Aluminum is Made.—The oxide, which is obtained from bauxite quarried by the company in Georgia, is fused with cryolite in pots of boiler-iron lined with carbon. An electric current is passed through these long series of pots, and the result is precisely similar to what it was when Hall first sent the seven-cell Grove battery current through his two-inch crucible in Oberlin—the melted aluminum collects on the carbon negative electrode, and, as already stated, the quantity thus collected daily is measured in tons. Continually, night and day, without cessation, this operation proceeds. The raw material is fed in as required; the product is removed and the carbon renewed. The waste of the process is said to be so slight as hardly to be an element of calculation. Then comes the casting into ingots and bars, the rolling into sheets, and the drawing into rods and wire.—From "Aluminum: A New-

comer Among the Metals," in American Monthly Review of Reviews for October.

THE AMERICAN MONTHLY REVIEW OF REVIEWS for October has several articles of unusual interest to women readers. Miss Frances Willard tells the story of the World's W. C. T. U. movement; Mrs. Ellen M. Henrotin, President of the General Federation of Women's Clubs, outlines the benefits of those organizations; Mrs. Sheldon Amos, of England, writes of a London Women's Club, and Miss Mary Taylor Blauvelt contributes an enlightening article on the opoortunities for women at the English universities.

"MAN AND THE MACHINE" is the title of a striking article from the pen of the Right Rev. Henry C. Potter, D. D., Bishop of New York, in the "North American Review" for October, the Bishop discussing, apart from other things, the tendency of the increased employment of machinery to *mechanicalize* the workman. No one, he asserts, can fail to perceive the enormous gains in convenience, comfort and luxury from the application of machinery to the arts. But the great gain is not without cost in many ways and of many kinds, and to the individual who works at a handicraft it is real and serious.

MAKE A MAN OF HIM.—The best way to cure a student of petty vices and childish trickery is to make a man of him. Give him something real to do and he will not fritter his nervous strength away in conviviality or in degrading associations. But to forbid excesses and abuses, putting nothing in their places, cannot be very effective. Not long ago I had occasion to say: "If your college assume to stand *in loco parentis*, with rod in hand and spy-glasses on its nose, it will not do much in the way of moral training. The fear of punishment will not make young men moral or religious—least of all a punishment so easily evaded as the discipline of a college. If your college claims to be a reform school, your professors detective officers, and your president a chief of police, the student will give them plenty to do. A college cannot take the place of a parent. To claim that it does is mere pretense. You may win by inspiration, not by fear. 'Free should the scholar be; free and brave.' The petty restraints that may aid in the control of college sneaks and college snobs are an insult to college men and college women. It is for the training of men and women that colleges exist."—From "College Discipline," by David Starr Jordan, President of the Leland Stanford, Jr., University, in North American Review for October.

"THE LAW OF THE BEASTS."—That war *is* recourse to the law of the beasts is said to be wrong, but it is not, I think, a question that need be dwelt upon. The grateful truth, is, of course, as Mr. Morley says, that the usages of war are constantly undergoing mitigation. Every year we launch upon the sea some more appalling engine of destruction. Progress is ever engaged in searching the secrets of Nature for yet swifter, surer, and more horrible improvements on her 'tooth-and-claw' appliances. We are still looking for a means of maiming twenty men where now, with our best Maxim guns, we can only reckon upon destroying five; yet the very spirit of humanity is brought into the battlefield, not under the Red Cross only, but in many ways. Nevertheless, war is what it is here said to be. Certain agreements of restraint and (what are far more to the purpose) certain customs of restraint are imposed upon its practice; but they do not change its nature, which shows worse in some respects if better in others. 'The old savage rule of *inter arma silent leges* is quite obsolete.' So I read, but the assertion will not pass where the ethics of politics rise one degree above martial-law standard. And when it is said that if to safeguard the existence and freedom of their country 'Lord Wolseley or General Billot were to do whatever a wild animal will do for life and liberty the world would ring with execrations,' there must be some misunderstanding or mishandling of words. Exactly what a beast will do in such affairs a man cannot do; nor could any general possibly imitate the defensive action of wild animals.—From "The Law of the Beasts." By Frederick Greenwood, in The Nineteenth Century for October.

THE LIVING AGE has so long maintained a conspicuous position in the current literature of the day, that it requires only to be known to be valued. At this season, when the reading public are deciding upon their subscriptions to periodical literature for the ensuing year, we feel it incumbent upon us to call especial attention to this weekly magazine. There is no single work published which is so calculated to inform and entertain readers *with the spirit of the age* —critical, political and literary.

In the issue of November 6 will be given the first instalment of a new serial story, "With All Her Heart," translated for "The Living Age" from the French of M. Rene Bazin. To all *new subscribers* for 1898, will be sent *gratis* the *eight numbers* of 1897, containing the first instalments of "With All Her Heart." $6.00 a year. "The Living Age" Co., Boston, Mass.

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HOUSEHOLD ECONOMICS.

BY MRS. JOHN L. HOGAN (LOUISE HOGAN.)
Author of "How to Feed Children."

During a course of dietary studies carried on recently at the Maine Agricultural Experiment Station it was demonstrated very clearly that milk should not be regarded as a luxury, but as an economical article of diet, which families of moderate income may freely purchase as a probable means of improving the character of their dietaries and of cheapening the cost of their supply of animal foods. To do this successfully milk must be regarded by the general consumer as a proteid food that should be used in place of meat and vegetables or as a supplement to smaller supplies of the same than is usual when milk is not added to the dietary. Inasmuch as Americans as a rule consume an undue proportion of fats and carbohydrates the use of milk in increased quantities appears to be generally desirable, for it was shown in the studies and experiments alluded to that the increased consumption of milk had the effect of materially narrowing the nutritive ratio of the dietary and raising the proportion of protein, thereby making it more rational. The experimental dietaries which contained an abundant supply of milk were found to be somewhat less costly than the others, and they were at the same time fully as acceptable. They showed very clearly how, in one direction at least, economy may be effectively exercised without detriment to health when purchasing a food supply—a frequent result of many non-scientific attempts at reaching economy in food from but one standpoint—viz., that of money outlay. It is quite true that appetizing means may be constructed that call for a small expenditure of money, but they must not be deficient in their proportions of the food constituents required for properly balanced rations. The results offered to the public by the combined theoretical work and practical experiments

concerning the nutrition of food made under the direction of the U. S. Bureau of Agriculture gives a scientific basis for the practical dietetic student from which much help may be derived by those who understand this movement towards ends meant to benefit the public in physical welfare with consequent mental equilibrium. However doubtful at present the arrival of such a result may appear to be to the pessimist, it is certain to be one of the future great results of this work. Small as the movement in America towards reform in man's feeding may appear to-day, it is evident to the careful observer that it is growng stronger all the time, and signs met with everywhere indicate that interest in the subject of food chemistry which was once special is rapidly becoming general in proportion to the growing realization upon the part of the public of the influences of a proper or an improper diet upon the health of the nation.

It is not too much to hope that all schools and colleges and other avenues for educational work will soon be open to the public for the thorough study of dietetics and everything pertaining to Household Economics. It seems strange to the thinking person who looks backward and notes the various advances that have been made in many sciences that during this same period of national growth in other respects there has been very little study given to questions of import in the physical and consequent mental care of the race. Household Economics is pretty generally looked upon as a comparatively new science in America. Not many years ago lamentable evidence could be seen of this general lack of appreciation of the necessity for physical care. Our forefathers were too busily engaged in the steady pursuit of riches, the establishment of a new country, the study of labor-saving devices, of inventions to procure increased supplies of various manufactures, of ideal yet impractical methods of education, etc., ad infinitum, to pay much attention to the physical condition of man and its demands. Physical culture as a science was rarely heard of, more especially for the benefit of children who were and often are still supposed to "have just grown" like Topsy, and many of them no doubt received as little care. One must believe that all this arose from want of insight, not from want of feeling, and because of the prevailing carelessness existing everywhere in regard to the careful provision of a proper environment for normal physical development. It is still considered weak and effeminate by many to pay special attention to nature's warnings of outrageous defiance of her laws,

nd little by little we are all paying the penalty. Possibly inheri-ance has much to do with this fact. A strong inheritance no doubt nabled our Puritan ancestors to resist nature's warnings with pparent success because results were not immediate, but one can-ot help but feel that succeeding generations, many of whom are o-day dragging out a miserable existence, have suffered seriously s a result of such violations of the laws of health.

Our country is especially young in its growth in this direction, nd appears to be just awaking generally to the fact, that there is reat need for reform in the nutrition of man. This may seem to e too broad a statement to many, but a careful and unbiased study f cause and effect, of carefully compiled statistics, of the tendencies f the times to self-indulgence and of the subjects that are to-day of eneral popular interest as compared to the attention that has been eceived by this subject for many years in older countries will cer-ainly convince the most superficial observer that the above state-nent is not overdrawn. It is the exceptional person to-day in the rdinary walks of life who pays any attention whatever to natural laws in life in their relation to hygiene and diet.

The uneducated person to-day, more especially the woman of the household, upon whom so much of household reform depends, prefers to live and seems to take pleasure in a state of pessimistic carelessness, keeping aloof from everything not of direct personal interest, possibly looking askance at those who may persist in for-geting individual needs for the general good. It is to this latter imited yet rapidly increasing class to whom honor is due, and to hem will we owe much when the principles underlying the chem-stry of food will be understood by every person interested in the making of a home. The work of the New York Household Eco-nomical Association is directly in this line, and it is moving along quietly but with a powerful force in an unaggressive yet effectual manner, quite different from the ways adopted by those reformers or faddists who are going to change the whole world at once and who do little but agitate and recriminate. All true reform work is a growth of slow but sure development, and great credit is due to those scientists and practical workers who keep on undaunted in their difficult work, inspired by a profound belief in the under-lying goodness of human nature which needs but to be touched, like the strings of a harp, to discourse sweet music. When the cience of household affairs is generally understood, when the tudy of household economics receive the attention it should upon

the curriculum of every school and college, when endowments will be generally made to enable scientists to make the careful experiment required in order to give simplified results to the public in a manner at once assimilable and comprehensible, then and then only may we look for effectual reform in this direction, for then every woman and homemaker in the land—these indirect nation-makers—will easily learn to understand the principles involved and naturally apply this knowledge in a manner that will benefit those dependent upon her ability for successfully carrying out the work that belongs in its outcome directly to woman in her own distinct sphere.

Herbert Spencer says that perhaps nothing will so much hasten the time when body and mind will both be adequately cared for as a diffusion of the belief that the preservation of health is a duty. He says: "Few seem conscious that there is such a thing as physical morality. Men's habitual words and acts imply that they are at liberty to treat their bodies as they please. The fact is, all breaches of the laws of health are physical sins. When this is generally seen, then and perhaps not till then, will the physical training of the young receive all the attention it deserves."

The objective features of the work planned for the winter's campaign of the New York Household Economic Association will depend to some extent upon the financial report received by the public, but it is hoped that the following ends will be accomplished:

1. The awakening of the public mind to the importance of a general study of Household Science.

2. The introduction into schools of this study, more especially into schools for girls and young women.

3. The establishment of training schools for domestics in connection with the hospitals, and independently, in the hope of solving the much vexed servant question in all its phases, and securing skilled labor in every department of the home.

4. The promotion of a more scientific knowledge of the care of children, of the economic and hygienic value of foods, fuel and clothing; a more intelligent understanding of correct plumbing and drainage in the home as well as need for pure water and good light in a sanitarily built house.

5. To keep members and others in constant touch with all literature of value in the making of a home through organized effort by a capable literature committee.

6. The establishment of a reading room for members where books that can be recommended will be sold for the benefit of the association, and subscriptions will be taken for such papers and journals as are of interest in the study of Household Economics.

7. The issue of monthly leaflets that will be edited by a well-known economic writer, calling attention to all current literature on the subject and giving careful reviews and analyses of selected books.

8. Offering to the public for a small admission fee an opportunity of hearing lectures by scientific experts in every line of economics, of joining in round table talks and conferences of especial value to mothers and home-makers, and of keeping thoroughly up to date in the study of home science with little effort and much interest.

"The winter's lectures and conferences, which begin Nov. 5, will be free to members, twenty-five cents to non-members.

Single membership fee is $1 per year; life members, $50. These lectures and conferences will be held every two weeks from the above date at Carnegie Building. The co-operation of every one interested in household science is earnestly solicited."

THE DISPOSAL OF GARBAGE AND REFUSE.*

By Rudolph Hering, M. Am. Soc. C. E. Chairman of Committee.

The subject upon which your committee was requested to make a report concerns the collection and disposal of the solid waste matter in cities, such as garbage, ashes, manufacturing refuse, etc. This branch of municipal work had heretofore not received satisfactory attention. There was much diversity of opinion regarding the proper methods to be pursued, and a basis upon which safe judgment could be founded did not as yet appear to exist.

It was, of course, impracticable for your committee to make any original investigations or experiments to enable it to solve the questions before it. Its work had to be confined to the collection of statistics, the inspection of works and the weighing of the evidence and opinions of those directly engaged in the actual work of garbage and refuse collection and disposal.

*Report of the committee of the American Public Health Association, at the annual meeting, Philadelphia, Oct. 29, 1897.—From Engineering News' Report.

In order to gather the needed information, circulars containing numerous questions were prepared and sent to 170 cities of the United States and Canada. The existing literature of the day was examined and visits of inspection were made, as was convenient, to the most important and instructive works of both Europe and America. By classifying, comparing and critically studying the information thus obtained, it became practicable to throw some useful light on the subject and to enable your committee to reach conclusions.

This information had been practically all compiled last year, and such of the results as were then apparent were reported at the last annual meeting. It was added then, that in view of certain forthcoming reports on some very thorough experiments, being conducted in the cities of Hamburg and Berlin, your committee did not deem it proper to present its own final report until after this European information had been obtained. Not until within the last few weeks did the documents reach this country. Their value, in the opinion of your committee, justified the delay in concluding its own work, as without embodying these European results, the committee's report would have failed to record the most complete, instructive and valuable experiments on garbage and refuse destruction for large cities that have yet been published.

The collection and disposal of garbage and refuse must be considered, first, from a sanitary, and secondly, from a financial aspect. Satisfaction must be given in both respects; otherwise, as previously reported, the result will not be successful. "There may be a disposal which is entirely proper in a sanitary way, yet the expense may be so great that the method precludes general adoption. On the other hand, some cheap method of disposal may not comply with sanitary requirements, and can also not be recommended."

The solution of the problem depends upon the character and composition of the matter to be dealt with, upon the quantity to be handled, upon the necessary transportation to the place of disposal, upon the character of organization in charge of the work, and upon the ultimate disposition to be made of the material.

The best method of disposal will vary according to what can or must be done with the material. When it contains matter that may be converted into useful products, its disposition might properly differ from that which is necessary when it must be destroyed in a

manner to prevent a nuisance or injury to health. Such utilization, when practicable, must be secondary in importance to a proper sanitary disposition. If the cost of disposal can be reduced by converting a part of the whole of the material into salable products, then utilization may be advocated for financial reasons, but only with the provision that a sanitary danger or nuisance is not created.

The best method of disposal when the quantity of material is small, may also be different from when it is large; it will also depend upon whether it must be transported to a great distance or can be disposed of near the point where it is collected.

The questions of collection and disposal are, therefore, somewhat complex. From the variety of conditions which may govern the case, it will be seen that proper answers can only be given when the special conditions existing in each city or town are known. In the opinion of your committee no single system of disposal can be recommended as being the best under all conditions.

This conclusion is further supported by the fact that the character of city refuse as collected differs materially in different countries, cities, and even in different parts of the same city. In some communities all refuse, namely, kitchen garbage, ashes and dry refuse from houses, factories, wharves, etc., is put into the same receptacles and delivered at the same point. In others, a separation is maintained of some of the materials, the food waste being collected in a different way and at different times from the dry refuse and ashes. In cities or parts of cities, where no sewerage system exists, the night soil or human excrement is collected in special receptacles, and is disposed of sometimes separately, sometimes together with other refuse matter.

The terms garbage and refuse were defined by the committee as follows: By garbage is meant animal and vegetable waste matter subject to rapid decay, and collected from kitchens, markets, slaughterhouses, etc., but not including night soil or street sweepings. By refuse is meant the miscellaneous material comprising the dry waste matter from houses, stores, factories and streets, such as ashes, paper, straw, wood, rubbish, etc. These definitions are most commonly used throughout the country. In the Southern States, however, the term "garbage" is sometimes applied to dry refuse (Atlanta, Ga.) and to a mixture of dry refuse with animal and vegetable waste. In New England the word "swill" is more commonly used to designate kitchen waste, while in Pennsylvania and one or two other States "slop" is the name applied to it.

The present final report to a certain extent supplements the previous reports, but it contains all the conclusions which have heretofore been stated. The appendix contains the replies to circulars from over 150 American and Canadian cities, which constitutes a valuable mass of information concerning the status of the question in this country. It also contains descriptions of the most important methods of disposal in detail and of receptacles, carts, wagons, etc., which appear to have given fair satisfaction. It finally contains descriptions of the best European practice and the results thereof.

COLLECTION AND REMOVAL TO PLACE OF DISPOSAL.

The committee has found that in comparatively few places was there a careful and wise consideration given to the character of utensils, receptacles, carts or wagons in which the refuse and garbage is collected. In most cases these articles are left to the judgment of house occupants or of contractors who collect the material.

No general recommendations can be given with reference to the character of the receptacles and wagons, because they should vary according to local conditions, and with the climate and method of final disposal. In cold countries, for instance, metal receptacles are not advantageous in the winter months, and wooden receptacles are preferred. The reverse is the case in hot climates. In all cases, however, they should be covered with a lid, and where cities give any directions at all with reference to these receptacles, this requirement is usually stated. Suitable cans for different conditions are described in the appendix.

Carts or wagons should be made of special design to suit the special conditions. Whether the garbage and refuse are collected in the same carts and wagons, or whether there is a separate collection, these carts and wagons should be covered. They should be covered with lids that can be easily opened and also firmly closed. They should be constructed of such shape that they can be easily and completely emptied of all their contents. Good designs for this purpose are found in use in some of our cities, and are given in the appendix. It may be found economical with certain cases of disposal, to have the carts so constructed that the boxes may be lifted off the wheels for dumping purposes. In some cases it may be found preferable and less expensive to collect the material in large wagons drawn by two horses, while in other cases carts with single horses may be preferred. With the variety of

ns that are in use, an intelligent selection of the most suitable n for given cases may be easily made.

here the garbage is disposed of by dumping at sea, special s and boats have been constructed for the purpose. The rience in Boston and New York City with such boats has prob- developed the most suitable apparatus of this kind. The boats o constructed that they can not only be readily loaded, but also lischarge the material by a single operation.

ıe collection of night soil from sections of the city not having rs is usually accomplished by apparatus known as odorless vators, and of these also there are several designs in the market h have proved satisfactory. The important features being an ght vessel means of introducing the night soil by pumping ıgh a special hose, and atachments for preventing the escape oxious gases.

garding the frequency of collecting garbage and refuse, there s to be no uniformity of practice, even in cities similarly sit- l. In some cases garbage proper is collected daily during the ner months; in most cases, however, but two or three times a . Often the collection is more frequent in the densely pop- d portions than in the suburban districts of the city. It is the on of your committee that no difference should be made with ence to the density of population. Readily decomposing rial should be removed as soon as possible after it has been ed for collection, as it will become odorous and objectionable lly as soon in the suburbs as in the center of the city. Decom- ion is a question of time, not of locality. The frequency of ction should, therefore, depend on the season. It should, if ble, be collected daily in hot weather, at least three times a : in the spring and fall and not less than twice a week in cold her.

hes and dry refuse may be collected at all times once a week out objection, this being the usual practice. Refuse from ness establishments or hotels must, in some cases, be removed : irequently on account of its rapid accumulation.

garbage is collected daily, no decomposition should take . Where it is collected less often in warm weather it is recom- ded that the receptacles, carts, wagons, etc., be disinfected, if practicable, washed every time after they have been used. n garbage and dry refuse are removed together the frequency llection should be the same as though it were all garbage.

CHARACTER AND COMPOSITION.

Your committee has been able to secure but little information on the composition of garbage and refuse in the United States. In English and German cities this material has been frequently analyzed. In this country we have only secured one satisfactory statement, namely, from New York City. The analyses are given in the appendix.

The combined garbage and refuse in Germany differs from that in England by being poorer in combustible matter. English refuse contains more unburnt coal and also more waste organic matter. For this reason the products of combustion weigh but one-third of the original weight in England, and about one-half of the original weight in Germany.

In America, so far as ocular inspection goes, the ashes contain fully as much unburnt coal as in England, and decidedly more than in Germany. The quantity of kitchen garbage and combustible refuse is greater per inhabitant in America than in England, and still greater than in Germany. While the amount of organic matter in American garbage is greater, it is also true that in most cities it contains more moisture. The large quantity of vegetable and fruit refuse in our country probably causes this result.

American kitchen garbage contains from 2 to 4 per cent. of grease. European garbage contains somewhat less, i. e., from 1 to 3 per cent. From kitchen garbage about 5 per cent. of the original weight is left as ashes after combustion. When American garbage and dry refuse, including ashes, are mixed and burned, about one-fourth of the weight of the original mass remains as clinkers and ashes; in England one-third and in Germany one-half. It is, therefore, seen that three-fourths of American mixed garbage, two-thirds of the English and only one-half of the German mixed garbage can be burned.

FINAL DISPOSAL.

The various ways in which garbage and refuse have been finally disposed of in American cities were mentioned in previous reports, and a few conclusions have already been drawn. In reviewing the subject, and with the recent evidence, particularly the above-mentioned European reports before it, your committee can complete and sum up its conclusions as follows:

It has already been said that different conditions require different solutions. In view of this fact, a distinction must first be made as to whether the garbage is to be disposed of by individuals or by the community at large.

(A) By Individuals.—If each householder must himself dispose of the garbage and refuse, as in the case of a country house or in a village, the following is recommended:

There appears to be no way in which this material can be properly and cheaply disposed of when the garbage is mixed with ashes and other refuse, and it is the opinion that in such cases it should be kept separated. There are several ways in which the most objectionable part, namely, the garbage, can be safely and properly disposed of. When it is fresh, and when nothing of a poisonous nature is added, then it can be safely fed to animals. In country houses this method is common. It is necessary, of course, that such feeding be confined to cases where proper intelligence can be exercised. The garbage from hotels is also very commonly sold for feeding, as it is profitable, and with proper care, no objectionable results need follow. Where this method is not applicable, or where dangerous results are feared, there are but two other methods which your committee can indorse, namely, cremation and burial. To burn the garbage in the kitchen stove by throwing it upon the coals is often practiced, but is objectionable on account of the offensive odors which arise therefrom. Within a few years means have been provided and are in the market for carbonizing the garbage in the flue leading from the kitchen stove. This process, where applicable, can be well recommended. The garbage is slowly dried, then charred, and finally can be used for fuel, all without the discharge of any odors. Where this carbonizing is not undertaken, the only other safe alternative is a burial of the fresh garbage.

The remaining refuse of a country house consists of ashes, dry rubbish, and perhaps also of night soil. In this case the latter is often converted on the premises into compost or manure and used upon the surrounding grounds. There can be no objection to such a method of disposal, if in case of certain sickness the night soil has been thoroughly disinfected. The disposal of ashes and rubbish will furnish no difficulties in the present case, as they can be dumped at an unobjectionable point on the premises or elsewhere.

(B) By Communities.—The problem becomes a very different one when garbage and refuse must be collected from many buildings as in cities, and a common disposal provided. The quantities to be dealt with become large, and the control over the character of the material is lost. Other methods of disposal must, therefore, be resorted to, if sanitary as well as economical results are to be obtained

In this case it becomes practicable either to combine all the various rejected materials, or to keep them separated. A choice between the two methods will depend upon the local conditions and customs. In many cities, in nearly every European city, the garbage and dry refuse, including ashes, are all mixed, removed and disposed of together. In American cities they are combined in some cases and in others a separation of some of the material is made. Your committee is not able to state that either one or the other method is to be preferred in all cases. There may be instances where a separation is better, and there may be others where the combined removal offers less difficulties and is less expensive.

(a) Separate Removal.—The fact that domestic garbage contains a fair percentage of grease, and that the remaining material may be converted into a fertilizer, has caused the development of processes in this country for converting garbage into these two materials, to be sold at a profit. Such a method of disposal is applicable only in large cities. The works, which must be erected for this treatment of garbage, can only be profitable if large quantities are handled. Such works have been erected in a number of cities in the United States. Companies were formed, and the work was undertaken with the expectation of conducting a very profitable business. Experience has demonstrated, however, that in many instances there was no profit, and in others that it was small. It has heretofore been found impracticable to conduct the works so that a nuisance would be wholly prevented, and it was, therefore, found best to locate them at points where an occasional nuisance would not be objectionable. After several years' operation a number of these works have been abandoned because, under the necessary sanitary restrictions they were not found to be remunerative.

From a sanitary point of view or as regards the creation of a nuisance, this process of disposing of garbage should be viewed with some suspicion. It should be allowed, and, in the opinion of your committee, is only justifiable when the works are so located that

a nuisance cannot possibly be created, and when it is also found to be cheaper to the community than cremation.

Experience has shown that in many cases this reduction process does not dispose of all the offensive material, and that it must be operated in conjunction with the cremation process, because some of the material collected with the garbage will neither yield grease nor make a good fertilizer, and is best disposed of by burning.

The latest and largest works for disposing of garbage by the reduction process have been built on Barren Island, where the garbage of New York and Brooklyn is being treated. Contracts for this treatment were made within the last year or two, and it appears at the present time that the history of these works may possibly not differ much from the history of others. In this case, however, the distance from inhabited sections and the great quantities of material to be handled, offer more favorable conditions for success than in most other cities. As the selling price of both the grease and the fertilizing residue has been steadily declining, it may probably be safely inferred that the profit of the reduction business does not meet the early expectations.

When the garbage is collected separately from the other refuse, then there remains another method for its disposal, which receives the commendation of your committee, namely, cremation. When garbage is separately collected it contains from 50 to 80 per cent. of moisture. This fact has made its burning difficult. There is insufficient combustible material contained in the same to evaporate the large quantity of moisture contained in fresh garbage while burning up itself. For this reason it has been necessary to add coal to supply the heat in most of the American furnaces. They are nearly all so constructed that the wet material is thrown directly upon the grate-bars. In the English furnaces the garbage and refuse are first thrown into an ante-chamber, where the material is dried before it reaches the grate-bars. Your committee is not aware of the existence of a furnace constructed after the English pattern where garbage alone, without the addition of rubbish, ashes and cinders has been consumed. It is, therefore, not in a position to state the actual results that would be found if garbage alone were burned in an English furnace. It seems, however, in view of the evidence before the committee, that it might possibly be found economical to subject garbage to a drying process before it is thrown upon the grate-bars. With moderately wet garbage and suitably arranged apparatus it seems possible that the com-

bustion might be effected with less coal than is now generally used. No intelligent experiments in this direction have, however, come to the attention of your committee, and no definite statement as to the economy of such a process can be given.

Besides the reduction of the kitchen garbage to grease and fertilizer, or its cremation, your committee is not able to designate any process by which the garbage of communities can be finally disposed of either economically or in a sanitary manner. If the garbage is disposed of separately there results the necessity of a separate disposal of the remaining material, consisting of ashes, cinders, rubbish and dry combustible matter. Ashes and incombustible refuse can be safely wasted or dumped for filling in low ground. Dry combustible matter, of which large cities usually furnish a considerable amount, is best disposed of by being burned in a crematory.

Your committee feels compelled to state, with reference to the disposal of these materials, that a separation does not seem to be economical or advisable, unless the conversion of garbage into saleable products is an assured profitable business. It has not so been found in the larger cities of Europe, and separation is not there practiced.

(b) Combined Removal.—When no separation is made of the various waste materials and all are collected together, there is, in the opinion of your committee, but one way in which the final disposal should be accomplished; namely, by cremation. This is the system successfully adopted under these circumstances in many cities of Europe, and is growing in favor every year. (See statistics in appendix.) In England the burning of city garbage and refuse has been practiced in some cities for half a century. Considerable experience has, therefore, been gained regarding the most suitable construction of the furnaces and the manipulation of the material.

Within the last two years extensive experiments have been made in the cities of Hamburg and Berlin on the subject of garbage and refuse cremation, as already stated. The results there obtained with garbage that contains less combustible matter than the English and still less than the American garbage and refuse, indicates without any doubt, that a destruction of this material by fire can be an economical process, besides offering a thoroughly sanitary solution of the garbage question.

'he European furnaces have not yet been introduced in Amer-
Within a few years, however, a furnace, resembling the Eng-
pattern, but apparently less efficient, has been erected in
ntreal. The experience gained with it has been fairly satisfac-
r. The garbage and ashes are mixed, and they burn without
addition of fuel. It is found necessary, however, as was also
nd necessary in some cities of Europe, to sift the material and
s to free it from the fine ashes, which choke the fires.

Garbage in America contains more moisture than that in
rope, and this fact has made it appear as though cremating
ıld not be as successful in this country; but your committee has
son to believe that the additional quantity of combustible mate-
usually contained in the average American garbage more than
npensates for this additional moisture, when the dry refuse and
bage are mixed. Without having a proper analysis at our
posal, we may say that to the eye there is no apparent difference
this respect between the mixed garbage and refuse of Europe
l that of America.

n view of the results obtained during many years in England
l lately obtained also in Germany, as fully given in the appendix
this report, there appears to be no reason why the same method
disposal, under the above-mentioned limitations and conditions
ɔuld not be applicable to this country by using properly con-
ucted furnaces and having efficient workmen, thereby effecting
lestruction of the material in a more sanitary way and probably
o more economically than by other methods that have been
ed.

Your committee finds that the recent report from Hamburg,
rich, and particularly the one from Berlin, have given material
a better understanding and judgment regarding the cremation
garbage than has been possible since the early English reports
the subject. A final report on similar experiments with similar
ults recently gained in Paris is also about to be issued.

The experience and results now before your committee indicate
at the English pattern of cell furnaces with sloping ante-chamber
a preliminary drying and heating of the garbage gives more
ɔnomical results than the large and level American furnaces. It
ɔo plainly indicates that a skillful construction of the entire plant,
d a skillful operation, requiring special training of the firemen,
e prime requisites to obtaining successful results.

HONESTY AND CLEANLINESS.

From the Brooklyn Eagle.

Our esteemed but misguided contemporary, the Herald of Rochester, takes us to task in a most astonishing fashion for our advocacy of free baths and a lot of them. It begins by the assertion that it is better to be honest than clean. To that we agree, heartily; but what is the matter with being honest and clean, too? It says that the proposition to establish free baths is a proposition to destroy public morality. "It is to teach people that they have a right to what they have not earned. Gloss the matter as you may, the person who accepts a free public bath has accepted what another person has been compelled to pay for. In ethics it is no more honest than would be the theft of 25 cents spent on a bath in a private establishment." It then argues that when the people have been taught that they have a right to wash in a public establishment they have also the right to sleep in public beds—many of them do; in jail and in the almshouse; to eat public dinners—many of them do if they can get into Congress or the Legislature; to free public clothes—look at our army! And if we once start out in this free handed way of doing things there is simply no end to it. It also says that the relation of baths to health is all moonshine and that one might as well say that free medical service is as essential to health. What! Have they no hospitals and dispensaries and health inspectors in Rochester? The desire to be clean cannot be cultivated, it says, by baths, for it is notorious that paupers are filthy. They are, and that is why we want to get some of them into the water. And it then draws the inference that, instead of makng people cleaner, free public baths, by tending to pauperize them, would make them dirtier.

If we had not heard it we never would have believed it. Not only would we not have believed that bathing, even in the East River, makes people more dirty, but we would not have believed that we pauperized ourselves by setting up baths for ourselves. If it is wrong to have free baths—and these are and always have been as free for the rich as for the poor—it must be equally wrong to have public works of all sorts. It must be degrading to have band concerts, since not one in ten thousand listens to them; it must be

injurious to have parks, since a great many people stay out of them; it must be debasing to have our streets graded, paved and cleaned out of a public fund, our garbage gathered and ashes removed by public contractors, our boulevards smoothed for pleasure travel and our streets and squares lighted at public expense; our new electric fountain is, by consequence of this finding, a menace; our municipal statuary a crime—well, we admit that some of it is; our public schools a waste; our public libraries a breeder of ignorance; our Board of Aldermen an unwarranted luxury; our health inspectors an interference; our free hospitals, asylums, almshouses, orphanages and homes an assault on our civilization; our police superfluous; in fact every common benefit that we enjoy out of the common funds raised by common taxes is a danger.

But really, we do not believe that it is. We believe that the individual who bathes, even for the fun of the thing and not as a sanitary measure or a civilized custom, is cleaner than the person who does not. We believe that the blood courses in more speedy and healthful currents through his veins than through those of the unclean, and that with healthy blood and a white skin he is less likely to think and to do mean, dishonest things than his neighbors. We believe that if he is taken young he can be made to accustom himself to the bath and that incidentally to this he will demand cleaner surroundings, will keep his clothes and his home and his street cleaner than they used to be. We believe, heartily, in the proverb that cleanliness is next to godliness, and if you take a company of progressive, honest, industrious Americans and an equal company of people from the east side of New York, the difference between the two companies will be obvious to all the senses in a minute. We want all of our people to get into the washing habit, not merely on their own account, but on ours. They endanger our health by their carelessness in that respect. They invite epidemics and create them. Nor have we heard that the public baths which have for years been a fixture in all the seaboard cities have become sinks of iniquity. On the contrary we have no doubt that they have not only been an encouragement to personal purity, but that in the hot months they have been a means of saving life. Deny to the poor those advantages which are possessed by the rich and you intensify discontent. When the poor are so very poor as they are in our cities and have neither the knowledge nor custom nor initiative to be other than as they are, it is a duty of the public, as its own government, to educate them out of their condition, to

give schools to them where their minds may be developed, in order that they may share intelligently in the work of self rule; to give baths to them, that they may be fit to associate together and with others without offense and without danger. A man cannot truly respect himself who is dirty. Stimulate the habit of cleanliness and we increase the safety of our cities. And give over the idea that a free bath is any more of a "gratuity" than the right to walk in the public streets.

THE METHOD OF DISINFECTION WITH FORMALIN.[1]

By Hans Aronson, M. D., Berlin.

In the beginning of the year 1892, Trillat[2] and I[3] independently made the first exact studies of the antiseptic properties of formaldehyd, and in the succeeding years many attempts were made to utilize the material for disinfection upon a large scale. The formaldehyd gas, to whose bactericide properties I called attention in my very first communication, was naturally the form in which it was sought to be employed. But simple as the problem appeared, there were great practical difficulties in the way of its solution. The easiest way was apparently to develop the gas by means of heat from the commercial solutions of formalin. It was soon apparent, however, that this method was an impossible one.

So soon as the concentration of the solution exceeded 40 per cent. a polymerizing of the formalin occurred, with a precipitation of solid paraformaldehyd. If the heating is continued a solid, coherent mass forms in the bottom of the receptacle employed, which finally begins to burn. To avoid this difficulty it has recently been attempted to obtain the gas from a solution of formalin in methylated alcohol, called holzin. This method, however, has several great disadvantages. The unavoidable spattering of the concentrated solution of formalin when heated may cause unpleasant accidents to persons in its neighborhood; the vaporization of large quantities of methylated alcohol is not innocuous; polymerization of the formalin cannot be entirely avoided; and large quanti-

[1] Translated from Zeitschrift fur Hygiene und Infectionskrankheiten, Vol. XXV., June, 1897.

[2] Comptes Rendues, T. CXIV., p. 1278.

[3] Berliner klin, Wochenschrift, 1892, No. 30. The paper before the Berlin Medical Society was read before Trillat's communication appeared in the Comptes Rendues.

:s of the costly wood alcohol are wasted. Finally, it is not possi- e with this apparatus to develop large quantities of formaldehyd .pors in a short space of time; and this latter factor is of vital ıportance for a thorough disinfection.

In a second class of apparatus an attempt is made to develop the rmaldehyd vapors by means of the oxidation of methyl alcohol ıelf. For this purpose a large number of lamps have been devised · Trillat, Bartels, Krell, Beuster, Schulze, and others. Practical e of these lamps on a large scale has given unsatisfactory results omp. Pfuhl[4]). This was to be expected when we remember that e oxidation of the methyl alcohol in these lamps is generally fected by means of glowing spirals of platinum wire, and the oduct of aldehyd, which alone is efficacious, forms necessarily ıly a small percentage of the methyl alcohol that is employed. ı far the greater part of it is lost as carbonic oxide and carbonic id gases. Apart from the cost a large number of lamps are quired to effectively disinfect even a small room, as Pfuhl has oved by practical experimentation.[5] Nor does it seem proper at the formaldehyd should be thus made at home, on a small ale, not to speak of the danger from fire. Schepilewski was right hen, in a recent communication, he doubted the possibility of sinfecting large areas by means of formalin in this manner.

Good results in disinfection upon a large scale were first ob- ined by Roux and Trillat[6] by means of a pressure apparatus ınstructed by the latter. In this a formaldehyd solution is greatly ıperheated under a pressure of three atmospheres. The deposi- ɔn of paraformaldehyd is prevented by the addition of calcic ılorid. But the apparatus has many disadvantages from a prac- :al point of view. Apart from its great cost (for all pressure ɔparatus must be very solidly and strongly constructed), I con- der it quite improper to give such autoclaves into the hands of ymen; and it would certainly be in contravention of our police gulations.

A simple apparatus which could be readily handled by the un- :illed, and by means of which sufficient quantities of formalin gas

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4Zeitschrift fur Hygiene und Infections krankheiten, 1896, Vol. XXII., 339.

5These remarks apply also to various American formaldehyd generars in which wood alcohol is used to produce vapors of formic aldehyd.

6Annales de l'Institut Pasteur, 1896, Vol. X., p. 283; comp. also Bosc., 298.

can be quickly developed for the disinfection of rooms and houses, is therefore a desideratum. Such a one has been constructed by the chemical factory of E. Schering.[7] In view of the great importance of the subject, I have gladly undertaken the task of making a thorough bacteriological investigation of its action. The solid polymerized formalin or paraform (called also trioxymethylen) is used for the development of the formalin vapors. The antiseptic properties of this body, which I[8] first described at the "Verein fur innere Medicin," March 12, 1894, depend upon the vapors which proceed from it at ordinary temperatures. At the same time I demonstrated by means of numerous experiments upon man and animals that the polymerized formaldehyd was an almost non-poisonous body, and was well borne by children when given internally, even in large quantities. The use of this body as a formalin gas developer is very appropriate. It has been found to be more practical in many ways to use the polymerized formaldehyd compressed into the form of pastils, rather than as a powder. (Each such formalin pastil, which contains 100 per cent. of formaldehyd, weighs 1 gramme [15.4 grains]).

The action of the apparatus is as follows: The hot gases of combustion transform the paraformaldehyd into gaseous formaldehyd, and are afterward thoroughly mixed with them. This mixture of the vapors of formaldehyd and of combustion enables the necessary quantity of moisture to be present to hinder a polymerization, and renders a thorough disinfection possible. In the stream of the gases of combustion a rapid distribution of the effective formaldehyd vapor into all portions of the space to be disinfected takes place.

The apparatus consists of a cylindrical sheet-iron mantel, beneath which is a spirit lamp with a suitable wick . In the upper part of the mantei hangs a vessel, destined to contain the foramlin pastils. The upper end of the vessel is provided with a number of slits, through which the gases formed by the combustion of the alcohol (carbonic acid and watery vapor) must escape. In their passage through the vessel there is a mixture of these vapors of combustion with the formalin vapors generated by the heating of the formalin pastils.

The mode of using the apparatus is extremely simple and safe. The disinfector is placed upon a sheet of tin on the floor of the room to be disinfected. In the apparatus that I employ from 100 to 150 pastils can be vaporized at once. For the production of

greater quantities of formaldehyd vapor, several of these apparatus must be used together.

The lamp is filled with ordinary alcohol (80 to 85 per cent.); about twice as many cubit centimetres of the fluid being employed as there are pastils to be vaporized in the vessel (i. e., 100 pastils repuire about 200 ccm. [7 ounces] of alcohol). The wicks should project but little above the necks of the burners, lest the apparatus get too hot. The vessel is to be filled with formalin pastils, and the disinfector placed over the lighted spirit lamp. Windows, registers, and other openings are to be carefully closed before the lamp is lit, and the keyholes should be stuffed with paper. After the room is closed the apparatus may be allowed to burn itself out.

I have experimented with this apparatus under conditions as similar as possible to those met with in practice. I used a room about 100 cbm. (3500 cubic feet) in size, 7.7 m. (25 feet) long, 4.0 m. (13 feet) broad, and 3.3 m. (10¾ feet) high, in different portions of which the test objects were placed. I may mention at once that there was no difference in the result whether these test objects were placed on the floor of the room, suspended in its middle, or put near the ceiling. This demonstrates the even distribution of the formaldehyd vapors, due to the fact that its specific gravity is almost the same as that of the air.

For test objects I employed the staphylococcus, the streptococcus, the bacillus pyocyaneus, typhoid and diphtheria bacilli, anthrax spores, and tubercle bacilli. The test objects were prepared in various ways. Sterilized strips of gauze or wall-paper, or strips of linen or woollen stuff, were soaked in bouillon pure cultures of the first five varieties of bacteria, and were used moist or after drying in vacuum. Anthrax cultures containing spores were scraped from the agar tubes, floated in distilled water, and used for the impregnation of threads of silk or gauze. In one experiment they were spread in a thick layer upon strips of sterilized wall-paper. The tubercle bacilli were used in the form of thick surface cultures on bouillon and also in the shape of tubercular sputum which was thickly smeared upon strips of gauze.

In the first series of experiments two disinfectors, each provided with 100 pastils, were placed in the room, making about 2 grms. (30.8 grains) for each cubic metre (35 cubic feet). After the test objects were placed in position, the two lamps were lit, the room closed, and only opened again after 24 hours. On first entering it the formaldehyd odor was so intense that I could only remain in

it for a very short time, on account of the great irritation to the eyes and throat. But opening the windows quickly dispelled the odor. The pieces of cloth, etc., were taken up with sterilized forceps, inoculated into bouillon tubes, placed in the incubator, and observed for weeks. In every case portions of the same test objects that had not been exposed to the formalin vapors were inoculated upon similar tubes to control the experiments; and in every case they showed an abundant growth. In a large number of the trials the test objects were washed in a dilute of ammonia solution after the disinfection, to remove any traces of formaldehyd, which might interfere with the growth of the culture. Similar non-disinfected test objects were treated with the same ammonia solution, and showed an undiminished vigor of growth.

The results of these numerous experiments, the minuter details of which are appended, were that, with the exception of a few tubes which were contaminated with other bacteria during the process of inoculation there was no bacterial growth in any of the tubes. To test the absolute sterilization of the anthrax gauze and silk threads, portions of them were inserted under the skins of guinea pigs. And while control animals treated in precisely the same way with non-disinfected material died after 1½ to 3 days, those treated with the disinfected material remained entirely healthy. The testing of the tubercle bacilli, both of the pure cultures and sputum, was done upon animals. Similar quantities of untreated pure cultures and of those that had remained for 24 hours in the disinfected room were rubbed up in a sterilized vessel with 6 ccm. (1 2-3 drachms) of water, and injected into the abdominal cavity of guinea pigs. The pieces of gauze with the sputum and dried were soaked in a similar manner in a few cubic centimetres of water, and similarly injected. The control animals died in from 4 to 5 weeks with typical tuberculosis, while the guinea pigs treated with the disinfected material remained healthy; and when I killed them six weeks afterward they showed no trace of tuberculosis.

The dust upon the floor of the room, and also that obtained by superficial scraping of its walls, proved to be entirely sterile after the 24 hours' disinfection.

A second series of experiments were made with one disinfector and 100 pastils, being one pastil per cbm. (35 cubic feet). All the non-spore containing material, staphylococci, streptococci, pyocyaneus, typhoid and diphtheria bacilli were killed after 24 hours' sterilization. But the anthrax spores were not in every case de-

stroyed. Some of the strips of gauze and silk threads proved sterile; but others developed a culture. For practical purposes, however, this number of pastils would be entirely sufficient.

I further made a series of experiments regarding the penetrating power of the formaldehyd vapors. In accord with the earlier results of Vaillard and Lémoine,[9] I found that it was not very

[9] Annales de l'Institut Pasteur, 1896, Vol. X., p. 481.

marked. Test objects wrapped in several layers of filter paper or thin muslin were, however, disinfected. Infectious material placed in the midst of the feather stuffing of a pillow was not satisfactorily reached by the formalin vapors. Steam would certainly be preferable for beds, mattresses, and other similar articles. Disinfection with formalin vapor is, however, very suitable for clothes, rugs, hangings, etc., that are hung up in the room. This I proved by a number of experiments.

It is important in such cases that all the surfaces are exposed as freely as possible to the air. If a test object, such as the strips of gauze impregnated with staphylococci or pyocyaneus, is put deep in the pocket of a coat, and compressed, disinfection (at least with 2 gm. [30.8 grains]) of the polymerized formalin to the cubic metre (35 cubic feet) does not take place with certainty.

One very favorable feature of the disinfectant process with formaldehyd gas is the fact that clothing and furniture are in no way attacked by it.

Of very great importance also is the non-poisonousness of the gas. In many of my experiments I allowed guinea pigs and rabbits to remain in the room while disinfection was going on, and I found the animals perfectly well the next day. On killing the animals there was not even, as might have been expected, irritative or inflammatory appearances in the bronchi.

It is a remarkable fact, and one to which I called attention to in my very first publication, that formaldehyd, so excessively poisonous to the schizomycetes, is relatively innocuous to the higher organisms. Even the hyphomycetes flourish in a nutrient medium containing an amount of formaldehyd that renders all bacterial development impossible.

For the disinfection of living rooms there is no method that can compare in the remotest degree, as regards certainty and simplicity, with that by means of formaldehyd gas. For example, any one who has seen the process of cleansing walls by rubbing them down with bread, as carried out by the disinfecting corps, will agree

with me that, however effective it may be from a theoretic point of view, it is absolutely inefficient in practice. The possibility of disinfecting rooms and all their contents with certainty by means of a simple, cheap, harmless, and easily managed method must be hailed as a great advance.

There is a further field for a smaller apparatus on the same principle in the deodorization of sick rooms, water-closets, etc. This can be effected with the formalin lamp by the continuous development of small quantities of formalin, such as one tablet of 1 grm. (15.4 grains) in several hours. Such a deodorization is not a merely symptomatic one, like that done by means of the ethereal oils or essences, not a mere displacement of one odor by another, but is a chemical change of the bodies causing the odors. Formalin unites with most of the foul-smelling bodies (sulphuretted hydrogen, mercapan, ammonia, organic bases, etc.) to form odorless combinations.[10] The smaller apparatus has been used for this purpose among others at the Lazarus Hospital in Berlin, and has done good service there.

[10] Schmidt, Pharmac. Zeitung, 1894, p. 55.

A large number of the appended experiments have been done repeatedly, and always with the same results.

Experiment No. I., January 22, 1897.

Room 3.3 m. (10¾ feet high, 4 m. (13 feet) broad, 7.7 m. (25 feet) long. Contents 101.6 cbm. (3500 cubic feet). Temperature 16° to 18° C. (61° to 65° F.)

The door closed very badly, and was made tight by nailing on a strip of cloth. The keyhole was stuffed with paper.

Two apparatus, each containing 100 pastils of 1 grm. (15.4 grains) were set up on the floor.

Nature of the test objects: Strips of sterilized gauze soaked in bouillon cultures and spore suspensions, and dried in vacuum.

Some of the test objects were fastened just beneath the ceiling of the room (O), others on the middle of the wall (M), and others were laid upon the floor (U).

After 24 hours the test objects were taken out and inoculated upon bouillon cultures. Then they were kept for 10 days in the incubator.

Diphtheria....U sterile; M sterile; O contaminated with large, movable, rod-shaped organisms.

Streptococci....O, M, U, sterile.

Typhoid.....O, U, sterile; M contaminated with long, immovable, rod-shaped organisms (hay bacilli?)
Pyocyaneus....O, M, U, sterile.
Anthrax.....O, M, U, sterile.

All the control cultures grew abundantly.

Experiment No. II., February 3, 1897.

The same room. Temperature 19° to 20° C. (66° to 68° F.).

Strips of gauze, partly dry and partly moist, freshly soaked with bouillon cultures; also anthrax silk threads. Two disinfectors containing 100 pastils each.

All the test objects were hung up on the middle of the wall.

All were washed with ammoniated water before being inoculated on the bouillon; the same was done with the control objects.

Observations made after 12 days in the incubator:

Dphtheria....Moist and dry; sterile.
Staphylococci.Moist; culture contaminated with long, staff-like organisms; dry; sterile.
Streptococci...Moist and dry; sterile.
Typhoid.....Moist and dry.
Pyocyaneus....Moist and dry.
Anthrax.....Silk threads and gauze; sterile.

Animal Experiment, February 4, 1897.

Guinea-pig (first control animal), 340 grm. (12 ozs.). Small piece of anthrax gauze inserted in a pocket under the skin of the abdomen. Death on the evening of February 6th.

Guinea-pig (second control animal), 500 grm. (17½ ozs.). The same treatment. February 7th, found dead early in the morning.

Gunea-pig, 270 grm. (9½ ozs.) Small piece of anthrax gauze, which had been in the disinfected room, inserted under the skin of the abdomen. March 1st, animal entirely well.

Guinea-pig, 480 grm. (17 ozs.) same as last. March 1st, quite well.

Experiment No. III., February 10, 1897.

The same room. Temperature 19° C. (66° F.).

Strips of sterilized gauze, strips of wall-paper, dried in vacuum after thorough soaking in well-developed bouillon cultures.

Spore-containing anthrax bacilli, spread upon a piece of carpet and dried.

All the test objects were taken out after 24 hours, and washed in ammoniacal water.

Observation, February 22.

	Wall-paper.	Gauze.
Staphylococci	sterile	contaminated.
Typhoid	sterile	sterile.
Pyocyaneus	sterile	sterile.
Anthrax	sterile	contaminated with small cocci. No bacilli.

Experiment No. IV., March 2. 1897.

Same room. Temperature 20° C. (68° F.).

Linen strips, pieces of thick woollen stuff, party moist, partly dried, soaked in bouillon cultures, and suspended from the middle of the wall of the room.

Two disinfectors, each containing 100 pastils.

Objects taken out after 24 hours.

The test objects were washed in ammoniacal water before being inoculated upon the culture tubes. The control cultures, which were submitted to the same treatment, all grew abundantly.

Observation March 12.

Linen Strips.

Diphtheria..moist; dry; sterile.
Typhoid....moist; dry; sterile.

Pieces of Woolen Cloth.

Diphtheria..moist; dry; sterile.
Typhoid....moist; dry; sterile..contaminated; a thick scum on the surface.

Linen Strips.

Staphylococci..moist; dry; sterile.
Pyocyaneus....moist; dry; sterile.

Pieces of Woolen Cloth.

Staphylococci..moist; dry; sterile.
Pyocyaneus....moist; dry; sterile.
Silk anthrax threads..O, M, U, sterile.

Animal Experiment, March 3, 1897.

Guinea-pig (1st control animal), 340 grm. (12 ozs.). Silk anthrax threads under the skin of the abdomen. March 5th, forenoon, death.

(2d control animal) 330 grm. (11⅝ ozs.). The same result. Death at noon, March 5th. Pure culture made from spleen.

(3d) 340 grm. (12 ozs.). Silk anthrax threads, that had been suspended from the ceiling of the disinfected room for 24 hours, introduced subcutaneously. April 2d, entirely well; weighs 400 grm. (14 ozs.).

(4th) 320 grm. (11¼ ozs.). Silk anthrax threads, that had been on the floor of the disinfected room for 24 hours, introduced under the skin, quite well; weighs 390 grm. (13¾ ozs.)

Experiment No. V., March 5, 1897.

The same room. Temperature 19° C. (66° F.).

Two disinfectors, each filled with 100 grm. (100 pastils).

Test objects: Gauze, linen, and woollen strips soaked in staphylococcus, typhoid, and pyocyaneus cultures, dried in vacuum and hung up at the middle of the wall of the room.

Taken out after 24 hours, washed in ammoniated water, inoculated upon bouillon tubes, allowed to remain in the incubator 14 days, and found sterile, with the exception of three tubes that were contaminated.

Strips of gauze soaked in pyocyaneus culture, wrapped in filter paper, and put at the bottom of a coat pocket. Sterile.

Strips of gauze soaked in staphylococcus culture, treated as above, showed an abundant development already the next day after they were taken out (March 7th).

The same with anthrax strips.

Experiment No. VI., March 8, 1897.

The same room. Temperature 21° C. (70° F.).

Two disinfectors, each filled with 100 pastils.

Test objects: Pyocyaneus, staphylococcus, anthrax cultures on gauze strips wrapped in blotting paper, partly hung up and partly placed in the middle of a feather cushion.

The test objects hung up free in the middle of the room were found sterile when inoculated upon bouillon tubes (observation after fifteen days). Those placed inside the cushion developed.

At the same time several large loops of superficial tubercle bacillus culture on bouillon were laid on a chair, and gauze strips thickly spread with tubercular sputum and dried in vacuum were also placed there.

Animal Experiment, March 9, 1897.

Guinea-pig (1st control animal), 480 grm. (17 ozs.). One loop of superficial tubercle bacillus culture was rubbed up in a sterilized

vessel with 6 ccm. (1 2-3 drachms) of water, and injected into the abdominal cavity. March 23d, 425 grm. (15 ozs.); April 8th, 385 grm. (13½ ozs.); April 15th, death; typical tuberculosis of the abdominal organs.

(2d control animal) 440 grm. (15½ ozs.). Tubercular sputum spread upon gauze was rubbed up in a mortar with 6 ccm. (1 2-3 drachms) of water. Product injected into the abdominal cavity. March 23d, 400 grm. (14 ozs.); April 8th, death; typical tuberculosis.

(3d) 500 grm. (17⅝ ozs.). Loop of superficial tubercle bacilli culture which had been 24 hours in the disinfected room suspended in 6 ccm. (1 2-3 drachms) of water, and injected into the abdominal cavity. March 23d, 495 grm. (17½ ozs.); April 8th, 560 grm. (19¾ ozs.) April 15th, lively. Killed. No trace of tuberculosis visible.

(4th) 350 grm. (12½ ozs.). Same treatment as with control animal No. 3. March 23d, 375 grm. (13¼ ozs.); April 8th, 410 grm. (14½ ozs.). April 15th, killed; entirely normal.

(5th) 460 grm. (16¼ ozs.). Tubercular sputum dried upon gauze, placed for 24 hours in the disinfected room, extracted with 6 ccm. (1 2-3 drachms) of water, and injected into the abdominal cavity. March 23d, 470 grm. (16½ ozs.); April 8th, 510 grm. (18 ozs). April 15th, killed; normal.

(6th) 385 grm. (13½ ozs.). Same treatment as with No. 5. March 23d, 400 grm. (14 ozs.); April 8th, 420 grm. (14¾ ozs.). April 15th, killed. No trace of tuberculosis.

Experiment No. VII., March 22, 1897.

One disinfector with 100 pastils.

Test objects: Strips of gauze soaked with bouillon cultures and dried in vacuum. Silk threads and gauze strips of anthrax.

Test objects taken out after 24 hours and washed with an ammoniacal water.

Results, April 2, 1897.

Diphtheria bacilli sterile. Staphylococci sterile. Typhoid bacilli sterile. Pyocyaneus sterile. Silk anthrax threads: 1 sterile, 1 showed long typical anthrax bacilli. Anthrax gauze has grown sparingly; typical bacilli.—Medical and Surgical Reporter.

"DEPARTMENT" OF PUBLIC HEALTH.

THE PROPOSED BILL TO ESTABLISH A DEPARTMENT OF PUBLIC HEALTH AND TO DEFINE ITS DUTIES.

Be it Enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

SECTION 1. That there shall be established a Department of Public Health, the duties of which shall be to collect and diffuse information upon matters affecting the public health, including statistics of sickness and mortality in the several States and Territories; the investigation by experimental and other methods of the causes and means of prevention of disease; the collection of information with regard to the prevalence of infectious, contagious and epidemic diseases both in this and other countries; also the causative and curative influences of climate upon the same; the publication of the information thus obtained in a weekly bulletin; the preparation of rules and regulations for securing the best sanitary condition of vessels from foreign ports, and for prevention of the introduction of infectious diseases into the United States, and their spread from one State into another, which rules, when approved by the President of the United States, shall, in so far as they are consistent with the existing laws, be adopted and enforced as quarantine regulations at the various ports of entry in the United States, and so far as applicable to interstate commerce to prevent the spread of disease from one State or Territory into another or the District of Columbia, be and become additional regulations thereof; the advising and informing the several departments of the Government on such questions as may be submitted by them to it, or whenever in the opinion of the Department such advice and information may tend to the preservation and improvement of the public health.

A special report of the said Department of Public Health, relative to such action as will most effectually protect and promote the health of the people of the United States may at any time be required by the President of the United States.

SEC. 2. That the Department of Public Health shall be under the control and management of a Commissioner of Public Health; said Commissioner of Public Health shall be appointed by the President of the United States, by and with the advice and consent of the Senate, and his term of office shall be six years; he shall be a regularly educated physician holding a diploma conferred upon him by a legally incorporated medical college in the United States; he shall have had at least ten years' experience in the practice of medicine, and shall be learned in sanitary science, and shall hold a membership in one or more reputable sanitary or medical associations in the United States.

He shall be entitled to a salary of $6,000 per annum, and his necessary traveling expenses.

That the Commissioner of Public Health shall semi-annually on the first Tuesdays of April and October of each and every year, and at such other times as he may designate, call to meet in the city of Washington, D. C., an advisory council to be composed of the secretary or executive officer of each State and Territorial board of health, and one officer learned in the law, detailed by the Attorney-General of the United States from the Department of Justice; and that the necessary traveling expenses of the said advisory council incident to their attendance on the meeting of the said council shall be paid on vouchers to be furnished by the Secretary of the Treasury, said meetings not to include more than six days at each session, unless a longer continuance shall be authorized by the President of the United States.

That the Commissioner of Public Health may appoint an Assistant Commissioner of Public Health, who shall be a physician in good and regular standing in the medical profession, and skilled in sanitary science, and fix his salary at not to exceed $3,500 per annum and all actual and necessary traveling expenses incurred in the performance of his duties as Assistant Commissioner in said Department. All officers and persons in the service of the United States, detailed to perform any duty under the provisions of this act, or any existing act, of the Congress of the United States providing for quarantine against diseases, or to prevent diseases from spreading within the United States, shall not receive any additional compensation except for actual and necessary expenses incurred in the performance of such duties, such expenses to be approved by the Commissioner of Public Health or his assistant,

id to be paid on vouchers provided by the Department of the reasury.

It shall be the duty of the Commissioner of Public Health to reside at all meetings of the said advisory council, and in case of is absence on account of illness or any other unavoidable cause, shall be the duty of the Assistant Commissioner of the Depart-ient so to preside.

SEC. 3. That the Department of Public Health hereby created ıall succeed to all the powers and duties now and heretofore con-:rred upon the Marine Hospital Service, or any officer thereof, y any law of Congress, except as hereinafter provided, and shall ccupy the building now occupied by the Marine Hospital Service or its offices, and shall have under its exclusive control and man-gement all offices, officers, laboratories, appurtenances and prop-rty of whatever name and nature, which are lawfully in possession f the said Marine Hospital Service at the time of the passage of his act, but it is hereby provided that there shall be in said depart-ıent a bureau to be known as "The Bureau of the Marine Hos-ital Service," which shall be under the exclusive control of the Commissioner of Public Health, and all laws governing the ppointment to official positions in said Marine Hospital Service, nd to promotions in said service, shall continue in full effect, and ll funds now or hereafter appropriated for the Marine Hospital ervice by Congress shall continue to be disbursed under the upervision of the Commissioner of Public Health by the direction f the Secretary of the Treasury until otherwise provided by law, it eing the intent and purpose of this act to continue the Marine Hospital Service and to confer all duties relating to quarantine and he public health upon the department hereby created.

SEC. 4. That whenever any department of Government, or the executive of any State or territory, or the Commissioners of the District of Columbia, or the health authorities of any State, shall request information from the Department of Public Health in regard to any matter pertaining to the protection or promotion of the public health, said department shall promptly furnish such information as it may have on record, together with any necessary or pertinent advice; and whenever any information shall be re-ceived by the department which the interests of the public health require should be promptly communicaetd to any department of the Government, or to any State officer, such information shall be forthwith furnished to the respective department or officer.

SEC. 5. That the department shall take such action, by adopting and enforcing such rules, and by correspondence or conference, as will tend most effectually to secure the co-operation of State, municipal, and local boards of health in establishing and maintaining an efficient and accurate system of notification of the existence and progress of contagious and infectious diseases, and of vital statistics in the United States, and said department shall also, by co-operation with the proper health authorities of foreign nationalities and municipalities, endeavor to extend to the United States a reliable system of international notification of the existence and progress of such diseases as cholera, yellow fever, typhus fever, smallpox, bubonic plague, or any other dangerous or contagious disease which may, in the judgment of the department, seem advisable to consider.

SEC. 6. That in sending notifications to, and receiving reports from, the different States or Territories in the United States, the department shall conduct all correspondence through the State and Territorial health authorities, and all information intended for local use received by the State and Territorial health authorities, and all information intended for local use received by the State and Territorial health authorities shall by them be forwarded to the local boards of health, or health authorities, within their jurisdiction, and all reports and information received from local health authorities, and local boards of health, shall pass through the office of the State or Territorial health authorities to the said Department of Public Health.

SEC. 7. That the department shall, when in its judgment it may deem it necessary and proper, make such additional rules and regulations as are necessary to prevent the introduction of infectious and contagious diseases into the United States from foreign countries, or into one State or Territory, or the District of Columbia, from another State or Territory or the District of Columbia, and when said rules and regulations have been made they shall be promulgated by the said department subject to the approval of the advisory council, and the President of the United States, and enforced by the sanitary authorities of the States, Territories, municipalities, and local boards of health, where the State, Territorial, municipal, or local health authorities will undertake to execute and enforce them, but if State, Territorial, municipal, or local health authorities shall fail or refuse to enforce such rules and regulations, the President of the United States shall execute and

enforce the same, and adopt such measures as in his judgment shall be necessary to prevent the introduction or spread of such diseases, and may detail or appoint officers for that purpose.

SEC. 8. That it shall be the duty of said department to perform all the duties in respect to quarantine and quarantine regulations, which are provided for by this act, or by any existing act of the Congress of the United States, and all duties in regard to the prevention and spreading of diseases throughout the United States as provided for in this act, and to obtain information of the sanitary condition of foreign ports and places from which contagious and infectious diseases are, or may be, imported into the United States, and to this end the consular officers of the United States at such ports and places as shall be designated by the Commissioner of Public Health, shall make weekly reports to the department of the sanitary condition of the ports and places at which they are respectively stationed, according to such forms as the Department of Public Health shall prescribe; and the Commissioner of Public Health shall also obtain, through all sources accessible, including State and Territorial sanitary authorities throughout the United States, weekly reports of the sanitary condition of ports and places within the United States, and shall prepare, publish, and transmit to collectors of customs, and to State and Territorial boards of health, and through them to municipal health officers, and other sanitarians, weekly abstracts of the consular sanitary reports, and other pertinent information received by him, and shall also, as far as he may be able, by means of voluntary co-operation of State and Territorial authorities, and through them municipal authorities, public associations, and private persons, procure information relating to the climatic and other conditions affecting the public health.

SEC. 9. That it shall be unlawful for any merchant ship or other vessel, from any foreign port or place, to enter any port of the United States, except in accordance with the provisions of this act, and with such rules and regulations of State, Territorial and municipal health authorities as may be made in pursuance of, or consistent with, this act; and any such vessel which shall enter, or attempt to enter, a port of the United States in violation thereof, shall, upon conviction of the Master thereof, forfeit to the United States a sum to be awarded in the discretion of the court, not exceeding $5,000, which shall be a lien upon said vessel to be recovered by proceedings in the proper district court in the United States. In

such proceedings the United States District Attorney for such district shall appear on behalf of the United States, and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

That any vessel, at any foreign port, clearing for any port or place in the United Staets, shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer, where such officer has been detailed by the President of the United States for that purpose, a bill of health in duplicate, in the form prescribed by the Department of Public Health, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers and crew; and said consular, or medical, officer is required before granting such duplicate bill of health, to be satisfied that the matters and things therein stated are true; and for his services in that behalf he shall be entitled to demand and receive such fees as shall by lawful regulations be allowed, to be accounted for as is required in other cases.

The President of the United States in his discretion is hereby authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port for the purpose of furnishing information, and making the inspection, and giving the bills of health hereinbefore mentioned. Any vessel clearing and sailing from any such port without such bill of health and entering any port of the United States shall, upon conviction of the Master thereof, forfeit to the United States not more than $5,000, the amount to be determined by the court, which shall be a lien on the same to be recovered by proceedings in the proper district court of the United States. In such proceedings the United States District Attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 10. That the Commissioner of Public Health shall from time to time, issue to the consular officers of the United States and to the medical officers serving at any foreign port, and otherwise make publicly known, the rules and regulations made by him, to be used and complied with by vessels in foreign ports, for securing

ıe best sanitary condition of such vessels, their cargoes, passen-
ers and crew, before their departure for any port in the United
tates, and in the course of the voyage; and all such other rules and
:gulations as shall be observed in the inspection of the same on
ıe arrival thereof at any quarantine station at the port of destina-
on, and for the disinfection and isolation of the same, and the
·eatment of the cargo and persons on board, so as to prevent the
ıtroduction of cholera, yellow fever, leprosy, bubonic plague,
ıallpox, or other contagious or infectious diseases; and it shall
e unlawful for any vessel to enter said port to discharge its cargo
r land its passengers except upon a certificate of the health officer
t such quarantine station, certifying that said rules and regula-
ons have in all respects been observed and complied with, as well
ı his part as on the part of the said vessel and its master, in respect
› the same and to its cargo, passengers and crew; and the master
f every such vessel shall produce and deliver to the collector of
ustoms at said port of entry, together with the other papers of
ıe vessel, the said bills of health required to be obtained at the port
f departure, and the certificate herein required to be obtained
·om the health officer at the port of entry; and that the bills of
ealth herein prescribed shall be considered as part of the ship's
apers, and when duly certified to by the proper consular officer,
r other officer of the United States, over his official signature and
:al, shall be accepted as evidence of the statements therein con-
ıined in any court of the United States.

SEC. 11. That the Commissioner of Public Health shall, and at
uch times as he may deem necessary, examine the quarantine
:gulations of all State and municipal boards of health, or detail
n officer of the said department to make such examinations, and
hall co-operate with and aid all State, municipal and local boards
f health in the execution and enforcement of the rules and regula-
ons made by the Department of Public Health under the pro-
isions of this act, or any other act of the Congress of the United
tates providing for a quarantine against disease, and to prevent
he introduction of contagious and infectious diseases into the
Jnited States from foreign countries, and into one State or Terri-
ory, or the District of Columbia, from another State or Territory,
r the District of Columbia; and all rules and regulations made
hall operate uniformly and in no manner discriminate against
ny port or place; and at such ports and places within the United
tates as have no quarantine regulations under State, Territorial

or municipal authority, where such regulations are, in the opinion of the Commissioner of Public Health, necessary to prevent the introduction of contagious and infectious diseases into the United States from foreign countries, or into one State or Territory, or the District of Columbia, from another State or Territory, or the District of Columbia, and at such ports and places within the United States where quarantine regulations exist under the authority of the State, Territory, or municipality which, in the opinion of the Commissioner of Public Health, are not sufficient to prevent the introduction of such diseases into the United States, or into one State or Territory or the District of Columbia, from another State or Territory or the District of Columbia, the Commissioner of Public Health, if in his judgment it is necessary and proper, shall, with the advice and approval of the advisory council, make such additional rules and regulations as may be necessary to prevent the introduction of such diseases into the United States from foreign countries, or into one State or Territory, or the District of Columbia, from another State or Territory, or the District of Columbia, and when said rules and regulations have been made and approved by the President of the United States, they shall be promulgated by the Commissioner of Public Health and enforced by the sanitary authorities of the State, Territories and municipalities, where the State, Territorial or municipal health authorities will undertake to execute and enforce them; but if the State, Territorial or municipal authorities shall fail or refuse to enforce said rules and regulations, the President of the United States shall empower the Commissioner of Public Health to execute and enforce the same and adopt such measures as in his judgment shall be necessary to prevent the introduction or spread of such diseases, and may detail or appoint officers for that purpose. The Commissioner of Public Health shall make such rules and regulations, with the advice and consent of the advisory council, and approved by the President of the United States, as are necessary to be observed by vessels at the port of departure and on the voyage, where such vessels sail from any foreign port or place in the United States, to secure the best sanitary condition of such vessel, her cargo, passengers and crew, which shall be published and communicated to, and enforced by, the consular officers of the United States. None of the penalties herein imposed shall attach to any vessel, or owner, or officer thereof, until a copy of this act, with the rules and regulations made in pursuance thereof, has been

posted up in the office of the consul, or other consular officer of the United States, for ten days, in the port from which said vessel sails; and the certificate of such consul, or consular officer, over his official signature, shall be competent evidence of such posting in any court of the United States.

SEC. 12. That on the arrival of an infected vessel at any port not provided with proper facilities for treatment of the same, the Commissioner of Public Health may remand said vessel, at its own expense, to the nearest National or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers and cargo; and after treatment of any infected vessel at a National quarantine station, and after certificate shall have been given by the United States quarantine officer at such said station that the vessel, cargo and passengers are each and all free from infectious disease, or danger of conveying the same, said vessel shall be admitted to entry to any port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State, Territorial or local authorities, the Commissioner of Public Health may direct vessels bound for said ports, to undergo quarantine at such said State, Territorial or local station.

SEC. 13. That whenever it shall be shown to the satisfaction of the President of the United States that by reason of the existence of cholera, yellow fever, or other infectious or contagious diseases in a foreign country, there is danger of the introduction of the same into the United States, and that notwithstanding the quarantine defense, this danger is so increased by the introduction of persons or property from such country that a suspension of the right to introduce the same is demanded in the interest of the public health, the President shall have power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate, and for such period of time as he may deem necessary.

SEC. 14. That whenever the proper authorities of a State or Territory shall surrender to the United States the use of the buildings and disinfecting apparatus at a State quarantine station, the Commissioner of Public Health shall be authorized to receive them and to pay a reasonable compensation to the State or Territory for their use, if in his opinion they are necessary to the United States.

SEC. 15. That whenever necessary there shall be purchased or erected, under the orders of the Commissioner of Public Health,

with the approval of the Secretary of the Treasury, suitable warehouses with walls and enclosures, where merchandise may be unladen and deposited from any vessel which shall be subject to a quarantine or other restraint, pursuant to the health laws of any State, at such convenient places therein as the safety of the public revenue and the observance of such health laws may require.

SEC. 16. That whenever the cargo of a vessel is unladen at some other place than the port of entry or delivery under the foregoing provisions, all the articles of such cargo shall be deposited at the risk of the parties concerned therein, in such public or other warehouses or enclosures, as the collector of customs shall designate, there to remain under the joint custody of such collector and of the owner or master, or other person having charge of such vessel, until the same are entirely unladen or discharged, and until the articles so deposited may be safely removed without contravening such health laws. And when such removal is allowed, the collector having charge of such articles may grant permits to the respective owners or consignees, their factors or agents, to receive all merchandise which has been entered, and the duties accruing upon which have been paid, upon the payment by them of a reasonable rate of storage, which shall be fixed by the Secretary of the Treasury for all public warehouses and enclosures.

SEC. 17. That the master of any vessel employed in transporting passengers between the United States and Europe, is authorized to maintain good discipline, and such habits of cleanliness among the passengers as will tend to the preservation and promotion of health; and to that end he shall cause such regulations as he may adopt for this purpose to be posted up, before sailing, on board such vessel in a place accessible to such passengers, and shall keep the same so posted up during the voyage. Such master shall cause the apartments occupied by such passengers to be kept at all times in a clean, healthy state; and the owners of every such vessel so employed are required to construct the decks, and all parts of the apartments, so that they can be thoroughly cleansed; also to provide a safe, convenient privy or water closet for the exclusive use of every one hundred passengers. The master shall also, when the weather is such that the passengers can not be mustered on deck with their bedding, and at such other times as he may deem necessary, cause the deck occupied by such passengers to be cleansed with chloride of lime, or some other equally efficient disinfecting agent. And for each neglect or violation of any of the provisions

of this section, the master and owner of any such vessel shall, upon conviction thereof, be severally liable to the United States in a penalty of one hundred dollars, to be recovered in any circuit or district court within the jurisdiction of which such vessel may arrive, or from which she is about to depart, or at any place where the owner or master may be found, or to imprisonment of not less than thirty days, or by both fine and imprisonment in the discretion of the court.

SEC. 18. That whenever the evidence shall appear conclusive to the President of the United States that cholera, yellow fever, typhus fever, typhoid fever, smallpox, diphtheria or other plague exists in any State or Territory, or in the District of Columbia, to such an extent that there is great danger of the spread of such disease into other States or Territories, or the District of Columbia, by means of vessels and vehicles engaged in the transportation of goods, passengers, and the United States mail, by land and water, or by persons traveling, on foot or otherwise, he is hereby authorized to call together the Commissioner of Public Health and advisory council to take such action as may be necessary to prevent the spread of such disease from one State or Territory into another, or from any State or Territory into the District of Columbia, or from the District of Columbia into any State or Territory, and the Commissioner of Public Health shall make such rules and regulations, by and with the advice and consent of the advisory council, and the approval of the President of the United States, as may be necessary to meet the emergency, and all such rules and regulations shall have the force of law, and supersede all other rules, laws or regulations for the time being at the place designated, and any one violating any such rules and regulations shall, upon conviction thereof, be subject to arrest and imprisonment for a period of not less than thirty days. The Commissioner of Public Health may temporarily employ such inspectors and other persons as may be necessary to execute all rules and regulations adopted as aforesaid to stamp out and prevent the spread of such disease.

SEC. 19. That the Commissioner of Public Health or any one appointed by him may, with the approval of the Secretary of the Treasury, select suitable localities for establishing stations on rivers and other lines of interstate commerce and travel by railroads, and may cause to be erected necessary temporary buildings for the disinfection of passengers, baggage, cargoes, vessels and vehicles,

and may enforce such rules and regulations relating therto as may have been, or may be, prescribed therefor.

SEC. 20. That the Secretary of the Treasury is authorized whenever a conformity to such quarantines and health laws require it, and in respect to vessels subject thereto, to prolong the terms limited for the entry of the same, and the report of the entry of their cargoes, and to vary or dispense with any other regulations applicable to such reports or entries. No part of the cargo of any vessel shall, however, in any case be taken out or unladen therefrom otherwise than is allowed by law, or according to the regulations and rules adopted and promulgated by the Commissioner of Public Health under the provisions of this act, or any existing act.

SEC. 21. That the Commissioner of Public Health and the advisory council, created under this act, shall devise such means and methods as they may deem most effective to control and exterminate all domestic diseases transmitted by contact, such as phthisis pulmonalis or tuberculosis, diphtheria, scarlet fever, smallpox, leprosy and all diseases dangerous to the public health. That the said Department of Public Health may, under the direction of the Commissioner of Public Health, make investigations, both in the United States and, if necessary, in foreign countries, into the nature, origin and prevention of contagious, epidemic and other diseases, and the causes and conditions of particular outbreaks of disease in the United States, and in order that said experiments may be made, the Commissioner of Public Health shall, if necessary, enlarge the laboratories of the Marine Hospital Service, erect and maintain such other laboratories as may be necessary, and to equip said laboratories with the best appliances obtainable for investigation into the causes of disease and how to prevent and obliterate the same.

SEC. 22. That the Commissioner of Public Health may engage the services of experts, not to exceed six in number, in such laboratories in the United States as are best adapted by location, equipment or special fitness, to aid the Department of Public Health in making investigations, the pay to be allowed such experts to be fixed by the Commissioner of Public Health. It shall also be the duty of the said department to investigate the best method for the disposal of sewage, the protection of public water supplies, to ascertain the best sanitary methods, to investigate all matters which relate to the public health, and to gather statistics relating to mar-

riages, births, and deaths, and cause of death, and when the same can be done without prejudice to the public service, the President of the United States may detail officers from the several departments of the Government for temporary duty to act under the direction of said department, to carry out the provisions of this act, and all other acts of the Congress of the United States providing for a quarantine against disease and to prevent the spread of any disease within the United States.

SEC. 23. That the Secretary of the Department of Agriculture, and the Commissioner of the Department of Labor shall respectively furnish for the use of the Department of Public Health such information as they shall from time to time gather upon the following and kindred subjects, to wit: 1. The investigation of foods; also drugs, liquors and wines, their standard of purity and their adulterations. 2. The transmission of disease from animal to man and *vice versa*, such as tuberculosis, glanders, etc. 3. The statistics of climate with relation to infectious and other diseases. 4. The statistics and conditions relating to consanguineous and other marriages liable to produce physically and mentally defective offspring; and any information leading to race improvement through better marriage selection than obtains at present. 5. The statistics relating to child labor and to confined and unhealthy occupations, etc.

SEC. 24. That it shall be lawful for the Commissioner of Public Health, when in his judgment it may seem necessary to confer upon any municipal or local health officer, or health authority, through the State or Territorial authorities in which he may have jurisdiction, power also to enforce the provisions of this act and any rules and regulations made in pursuance thereof, and any person who shall knowingly disobey or violate any order, rule or regulation made pursuant to the authority herein conferred, shall, upon conviction thereof, be deemed guilty of a misdemeanor punishable by a fine of not less than $500 or by imprisonment for a period of not less than one year.

SEC. 25. That the Commissioner of Public Health shall make an annual report of the operations of the Department to Congress with such recommendations as he may deem important to the public interest; and said report, if ordered to be printed by Congress, shall be done under the direction of the Commissioner of Public Health, and that all mail matter of whatever class relative to the Department of Public Health and its duties, and addressed

to the Commissioner of Public Health and indorsed "Official Business, Department of Public Health," or mailed by said department, shall be transported free of postage; and if any person shall make use of such indorsement to avoid the payment of postage in his private letter, package or other matter in the mail, the person so offending shall, upon conviction thereof, be deemed guilty of a misdemeanor and be subject to the penalty prescribed by the existing law.

SEC. 26. That the Commissioner of Public Health is authorized to appoint for duty not to exceed six sanitary inspectors, at a salary not to exceed $1,800 per annum each, and their necessary actual traveling expenses; at least two of these inspectors shall be experts in quarantine matters, two shall be skilled bacteriologists, and one shall be an expert statistician. The Commissioner of Public Health is authorized to employ one chief clerk at a salary of $1,800; one clerk of class three at $1,400; and one clerk of class two at $1,400; and four clerks at $1,000 each, one messenger at $800, one stenographer at $800, one watchman at $600 per annum.

SEC. 27. That any officer, or person acting as an officer, or agent at any quarantine station, or other person employed to aid in preventing the spread of disease, who shall wilfully violate any quarantine laws of the United Staets, any of the provisions of this act, or any of the rules and regulations made and promulgated as provided for in this act, or any other act of the Congress of the United States providing for and regulating quarantine against disease, or to aid and prevent the spread of any disease within the United States, or any lawful order of his superior officer, or officers, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than $500, or imprisonment for not more than one year or both, in the discretion of the court.

SEC. 28. That when any common carrier or officer, agent, or employe of any common carrier shall wilfully violate any of the quarantine laws of the United States, or the rules and regulations made and promulgated as provided for in this act, or any other act of the Congress of the United States regulating and maintaining a quarantine against disease, and to prevent the spread of disease within the United States, such common carrier, officer, agent, or employe shall be deemed guilty of a misdemeanor, and shall upon conviction thereof be punished by a fine of not more than $500 or imprisonment for not more than two years, or both, in the discretion of the court.

SEC. 29. That any person who shall wilfully violate any rule or regulation made and promulgated by authority of this act, or any other act of the Congress of the United States, providing for a quarantine against disease, and to prevent the spread of any disease within the United States, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than $500 or imprisonment for not more than two years, or both, in the discretion of the court.

SEC. 30. All convictions for the violation of any of the provisions of this act, or any other act of the Congress of the United States, providing for a quarantine against disease, and to prevent the spread of any disease within the United States, shall be tried in the district wherein the offense was committed, and it shall be the duty of the United States District Attorney for such district to appear on behalf of the United Staets, and all trials and proceedings shall be conducted in accordance with the rules and laws governing criminal cases triable in the United States courts.

SEC. 31. That all rules made and promulgated, adopted and published pursuant to the provision of an act entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service," approved Feb. 15, 1893, shall remain in force until the same are annulled, changed, or modified, as provided for by this act, and other acts of Congress providing for quarantine against diseases, and the spread of any disease within the United States.

SEC. 32. That all rules and regulations made and promulgated to enforce the provisions of this act, or any other act of the Congress estimates of the expense necessary to maintain properly ease, and to prevent the spread of any disease within the United States, shall be approved by the President of the United States, and when approved by him shall have all the force and effect of law.

SEC. 33. That the Commission of Public Health shall annually submit to the Secretary of the Treasury, for transmission to Congress, estimates of the expense necessary to maintain properly the Department of Public Health for the ensuing year. That there shall be, and hereby is, appropriated out of the moneys in the Treasury and not otherwise appropriated, the sum of $75,000 for the purpose of this act. The sum of $1,000,000 already appropriated and known as an emergency fund to be expended by the President of the United States or the balance thereof not already

expended, shall be a fund and held and expended at the discretion of the President of the United States in the execution of the provisions of this act.

SEC. 34. Sec. 1, Chapter 19, Supplement to the Revised Statutes, Vol. 1, second edition, revised and continued (page 637) is hereby amended so as to read as follows:

Sec. 1. *Be it enacted, etc.*, That medical officers of the Marine Hospital Service of the United States shall hereafter be appointed by the President, by and with the advice and consent of the Senate, and no person shall be so appointed until after passing a satisfactory examination in the several branches of medicine, surgery and hygiene before a board of medical officers of said service. Said examination shall be conducted according to rules prepared by the Commissioner of Public Health, and approved by the advisory council and the President.

SEC. 35. Sec. 4,796 and 4,082, Revised Statutes of 1878, Chapter 66, laws of 1878, Supplement to Revised Statutes, Vol. 1, second edition, revised and continued: "An act to prevent the introduction of contagious or infectious diseases into the United States."

Paragraph 9, chapter 130, laws of 1875, same supplement: "An act making appropriations for sundry civil expenses of the Government for the fiscal year and for other purposes."

Sec. 7, chapter 156, laws of 1875, same supplement: "An act to promote economy and efficiency in the Marine Hospital Service."

Chapter 51, laws of 1890, same supplement: "An act to prevent the introduction of contagious diseases from one State to another, and for the punishment of certain offenses."

Paragraph 5, chapter 195, passed July 16, 1892.

Paragraph 3, chapter 211, passed March 3, 1893.

Paragraph 6, chapter 174, passed July 31, 1894.

Chapter 300: An act amendatory to the aforesaid, passed Aug. 18, 1894.

Paragraph 9, chapter 177, passed March 2, 1895.

Chapter 114, Supplement of the Revised Statutes, Vol. 2, laws of 1893: "An act granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service," and all other acts, or parts of acts, inconsistent herewith, or repugnant to the provisions of this act, are hereby repealed.

SEC. 36. This act shall take effect and be in force sixty days after its passage, within which time the Commissioner of Public Health and Assistant Commissioner of Public Health may be appointed. —Journal of the American Medical Association.

THE SHIP ISLAND QUARANTINE.

From the "Times-Democrat," Nov. 7, 1897.

So much has been printed from various sources about the National quarantine station at Ship Island in connection with the present epidemic of yellow fever on the Gulf coast that I believe the public will be interested in a statement from the officer in charge of the station. I have refrained from appearing in the matter to any extent until very recently, partly because I hoped an honest investigation of the subject would be made by some of the many local people who are interested in the health of the coast, and partly because I have been waiting to see some definite charge tending to connect the epidemic directly with this station. There is no one in the United States more interested than I am in tracing the epidemic to its source, but I do protest against the many vague and extravagant charges which have been made by newspapers and individuals who have no knowledge of the facts and no evidence to support their outrageous statements, and particularly I wish to call the attention of both public and health officers to the fact that nothing is gained, but all lost, by accepting a false theory of the origin of the fever and failing to find the real source of danger. It is of the utmost importance not to lose the true scent altogether by stopping to bark; and little or nothing has been done so far except to bark at Ship Island, with an occasional yelp at Mobile.

At the very beginning of the present excitement the Secretary of the Mississippi State Board of Health came out in an interview, which was given to the newspapers generally, in which he expressed the opinion that the epidemic would be traced to Ship Island, but said that there was no present proof. I have seen nothing from Dr. Hunter on the subject since, and believe he has never discovered the evidence he sought. Indeed, he acknowledged that the quarantine was well isolated, claiming the credit, however, for the State Board of Health.

The Times-Democrat took up this interview in a leading article and added an array of extraordinary charges, which I take occasion here to pronounce absolutely baseless, severally and in full. It is not necessary to take up these charges individually. The Times-Democrat gave no source of information, nor evidence, nor spe-

cific instances which could be traced up. It has not since published any evidence in support of its charges.

The latest and most conspicuous attacks on the station have come from Dr. C. P. Wilkinson, resident physician of the Mississippi River Quarantine Station, and Dr. John B. Hamilton, of Chicago. Both are alike remarkable for their lack of correct information of the actual situation at Ship Island, and for the lack of any effort to obtain information.

Dr. Wilkinson's article is an attempt to establish, by a process of inductive reasoning a question of present fact which he knows nothing of directly and does not even pretend to know. He begins by telling how yellow fever slipped into Fort Barrancas, Fla., one year. Good. Let him be careful it does not escape past his own quarantine some time. The president of a local Board of Health not far away thinks he can prove it did so this year.

He says yellow fever was undeniably traced from Ship Island to Biloxi in 1886. I dispute this absolutely. There was an active and bitter discussion as to the character of the fever that year, but no evidence was ever brought forward to connect it, whatever it was, with Ship Island. All the evidence which I have heard or seen tended to show that the first cases occurred in some oyster openers who had just arrived from some place, I think, in Louisiana.

Dr. Wilkinson then proceeds with some historical matters which have since been very much lighted up by a letter from Surgeon H. R. Carter in The Times-Democrat of Oct. 26. He touches upon the great storm of 1893, and compares the Chandeleur Quarantine Station, built on a heap of sand in the open Gulf, with the Mississippi River Station, situated many miles up the river. Finally he arrives at the abrupt statement, "From Ship Island Quarantine Station has come to the Southern country this visitation of yellow fever."

How does he attempt to establish this?

Argument 1. Dr. John Guiteras has said that the present yellow fever invasion came from Cuba. Several vessels have come from Cuba to Ship Island this season. Ergo: yellow fever reached the coast from Cuba through Ship Island.

But did no vessels reach New Orleans from Cuba this year; and does not the ergo apply there as well? Does Dr. Wilkinson mean to say that the ten vessels cited by him are the only ones from Cuba to the Gulf coast this season, and that none came through any port except Ship Island?

Argument 2. This is a touch of poetry. The doctor pictures the masters and crews of vessels, and their wives and sweethearts and friends, rushing into each other's arms across Mississippi Sound as soon as the first night falls. It is pretty, but it exists only in the doctor's imagination. Poetry and fact are often at variance, and are so in this instance.

Argument 3. Colon, a highly infected place, is another port from which some vessels have sailed to Ship Island. Ergo again, as in Argument 1, and with equal absurdity.

By the same method of inductive reasoning Dr. Wilkinson attempts to reverse the diagnosis of seven cases of disease treated in hospital here, and claims to find something in this. I have already commented upon this absurd reasoning in a previous letter.

The whole argument is absurd, for when yellow fever does come here, whether from Havana or Colon or New Orleans, the station is perfectly adapted to care for it, and is here for that purpose. The greater number of vessels he can show to have come to Ship Island from Cuba and Colon the greater value he gives to the station.

The accusations against the station made by Dr. John B. Hamilton, of Chicago, have attracted a great deal of attention, but I will not dwell upon them at length. It seems strange that the people of this part of the country should look to Chicago for evidence of things which are right under their noses; nevertheless, when Dr. Hamilton says that Ship Island is only five miles from the mainland, and is surrounded by shoal waters on three sides, the newspapers print it after him in great glee, and refer to it as an argument against Ship Island Quarantine Station. Dr. Hamilton is a man of distinguished ability and reputation, but neither a doctor of laws nor a distinguished surgeon can change the topography of the earth's surface. If he could, and if the people of the coast would accept it as cheerfully as they do his statements, he would annex Ship Island to the mainland and do away with Mississippi Sound and the harbor altogether.

Dr. Hamilton enters into a history of his own policy when Surgeon-General. This is a matter open to discussion, of course; but the fundamental part of his whole argument is his false account of the geography of Ship Island. There is no excuse for this, for there are charts of these waters, issued by the Coast and Geodetic Survey of the United Sttaes, which are readily accessible to all and absolutely reliable. Dr. Hamilton's charges against the present conduct of the station are, like so much else that has been put in print

lately, inspired by a desire to do injury without being supported by facts, and like the rest, he gives no source of information and no evidence.

In considering these charges, the animus which actuates them must be borne in mind. It must be remembered that Dr. Hamilton was once Surgeon-General of the Marine Hospital Service, and wanted to be again, but could not, and his bitter personal enmity to Surgeon-General Wyman has been notorious.

By far the most important item that has yet been published has appeared in an interview from Dr. J. W. Belden, of New Orleans, in the Picayune of Oct. 27. It is there made public that a case of yellow fever arose in New Orleans in May or early in June of the present year, and that the sufferer, Dr. Belden, had not been out of the city for the seven days immediately preceding the attack. This carries the infection farther back than has before been known.

In the fashion of the day Dr. Belden heaps his curse upon the universal scapegoat, Ship Island Quarantine, and in order to do so he claims a period of incubation of nine days, and advances a theory of infection which is contrary to facts that I can positively prove. The subject is under investigation now, and I only want to say here that I can completely disprove Dr. Belden's charges when all is brought out.

I would like to give a short description of the situation of the quarantine station and the manner of conducting it, as they really are. Ship Island is eight miles long and is somewhat curved in outline, the extreme eastern end being nine miles from the nearest part of the coast and the western extremity twelve miles. Mississippi Sound separates it from the mainland, and is so deep here that large steamships pass through it from Ship Island to Horn Island. The island is in two parts, joined by a long, low neck of sand, sometimes cut in two by the tide. The lighthouse, fort and the ruins of the old National Board of Health wharf are at the west end and the quarantine station on the eastern portion, the buildings being ten and one-half to ten and three-quarter miles from the nearest part of the coast. The quarantine buildings are separated into two groups by a lagoon, the administrative department being on the west and the isolation hospital on the east of this lagoon.

Parallel with the slightly concave shore of Ship Island, and half a mile out, is a deep channel the full length of the island. The eastern part of this is reserved for the quarantine station and the west-

ern part is the harbor. The vessels lying in the two anchorages are separated by an average distance of four miles, and those in quarantine are completely isolated from those in the loading berths. There is a general quarantine anchorage, and to the east a special anchorage for infected vessels, both being well marked with buoys.

The method upon which I have mainly relied to prevent the possibility of any spread of infection from or in the station is to destroy all infection as soon as it reaches quarantine. To this end any sick person is removed from the vessel at once and taken ashore, his body is bathed in bichloride solution, clean hospital clothing is put on and his own clothing and effects are thoroughly disinfected. The vessels are disinfected as promptly as possible after arrival. After disinfection they are, of course, no longer infected, and the subsequent detention is only for the purpose of seeing whether any new infection is going to arise in the crew within the period of incubation of the disease guarded against.

Following this system, I have enabled several non-immune persons to live at the station without danger. For dealing with the infected vessels immediately on arrival there are two immune assistant physicians at the station this summer and several immune attendants. I can confidently assert that I have prevented the lazaretto itself from becoming infected, and I offer proof of this. Contrary to the theory of quarantine, I employed a non-immune nurse to tend yellow fever here, only requiring that he should be capable, reliable and not afraid of that disease. During the present epidemic there has been a large number of local cases of the fever treated at the station, and this non-immune nurse has lived for weeks continuously in the hospital, not leaving its immediate vicinity night or day, and has not contracted yellow fever. This is certainly a physiological test.

In regard to the wild statements about communication with the outside, and about persons stealing ashore at night and troops of "nurses" going on excursions and meeting people on wharves, they are all absolutely false. These things cannot and do not take place here. During the quarantine season the station lives apart from the rest of the world.

I am ready to explain anything about this quarantine to anyone who is interested in the truth; and I refer to others who are familiar with the situation here, only protesting against extravagant charges from persons who do not know what they are talking about. Notwithstanding the opposition of the Mississippi State

Board of Health to the location of the station on Ship Island, I do not hesitate to refer to Dr. H. M. Folkes, State Quarantine Physician for Cat Island, and to Dr. B. F. Duke, State Quarantine Physician for Round Island, as to the health of vessels released from here, and to Dr. Folkes as to the location of the station and facts regarding its conduct, of which he has knowledge. I also invite statements from any others who are in a position to know the actual situation at Ship Island and what takes place here.

A. C. SMITH,
Passed Assistant Surgeon, M. H. S.

Gulf Station Quarantine, Nov. 4, 1897.

Besides the foregoing with regard to the history of this site for a Gulf quarantine the Editor hereof would add the following (From Report of National Board of Health, 1879, p. 466):

. . . "September 26, 1879: *Ship Island*, with a view to establishing a station convenient to the commerce of Mississippi Sound, west of Pascagoula, including the Rigolets. Accepting the soundings of a coast survey chart, No. 90, there is an abundance of water and good anchorage within easy boarding distance of the whole north side of the island. . . . An examination of a coast chart of Mississippi Sound will, I think, satisfy the board that this is a peculiarly appropriate place for a quarantine establishment, covering a wide sphere of usefulness. I have taken much pains to elicit the opinions of merchants in New Orleans, who have borne the burdens of the Mississippi quarantine, whether it would not, to a great degree, do away with the one they now have; and with almost one accord they commend it, especially for all infected vessels. . . I therefore recommend Ship Island for a Gulf quarantine, to be provided with all the paraphernalia necessary to a complete establishment."

"A. N. BELL,
"Quarantine Inspector National Board of Health."

Every sanitarian who has given attention to the practical work of Dr. John B. Hamilton while he was Surgeon-General of the Marine Hospital Service knows that the removal of the quarantine from Ship Island to the unstable Chandeleur sand beach, from which it was swept by the storm of October 1, 1893, was due to his assumption of superior knowledge to the National Board of Health, which, by his superior knowledge of practical politics he had superseded. For he had access to special surveys and reports which plainly showed the greater advantage of Ship Island in all respects. And his present effort to show the danger of the Ship Island quarantine from its proximity to the localities where yellow fever recently prevailed evinces a like defiance of recorded knowledge of yellow fever, which in default of practical knowledge, as a reasonable and practicable man, he ought to accept.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Twenty-fifth Annual Meeting, Philadelphia, October 26-29, 1897.

Abstract of Proceedings.

The association met at Hotel Walton, at 10 oclock, and was called to order by the President, Dr. Henry B. Horlbeck, Health Officer of Charleston, S. C., who in a brief introductory address, referred to the unavoidable absence of many of the members residing in the Southern States on account of the prevalence of yellow iever there. He announced that Dr. Irving A. Watson, of Concord, N. H., had some time ago sent in his resignation as Secretary, and Dr. C. O. Probst, of Columbus, Ohio, was chosen to act as Secretary pro tem.

After some routine business Dr. Frederick Montizambert, General Superintendent of Quarantine of the Dominion of Canada, chairman, read the "Report of Committee on Steamship and Steamboat Sanitation, in which he directed attention to the bedding of passengers—those portions of it which are not regularly laundried—blankets, mattresses and pillows, saying they should be freely exposed to the air and, if possible, to the sunshine after each trip. The somewhat common usage on inland steamboats of having the dining-room on a deck below the water-line was not to be commended. Such a position renders proper cleanliness and ventilation more difficult, and tends to unwholesomeness. Reference was made to the exposure of the traveling public on steamboats, as elsewhere, to the danger of contracting consumption from fellow-travellers suffering with that disease, who, in their expectorations, scatter infectious material broadcast. Objectionable and indefensible as it is at all times, with steamboat saloons closed and artificially heated the expectorator's filthy habit becomes especially dangerous to other passengers. The sputa drying on the decks rises as dust, to be inhaled, and to add to the great list of the victims of this fell destroyer of mankind. All spittoons should contain water or a disinfectant, which should be frequently changed.

Dr. Eduardo Liceaga, President of the Supreme Board of Health of Mexico, sent a paper entitled "A Study of Yellow Fever from a Medico-Geographical Point of View," which was read by Dr. Gihon, in the absence of the author.

The author said in part that in the port of Vera Cruz, which, as had already been shown, could be considered one of the sources in which the yellow-fever germ obtains a spontaneous growth, yet only three cases of the disease have appeared during the period under study, and these three cases occurred within the month of June. With respect to other points on the Gulf Coast, and especially the ports, it could safely be asserted that during the period covered by this report not a single case of yellow fever had presented itself.

Passing to the Pacific Coast, and bearing in mind the terrible epidemic that in the year 1884 desolated the coast, the Supreme Board of Health of Mexico had taken especial care to prevent the disease from being imported from the Central American countries, where unfortunately it now prevails in an epidemic form. Difficulties were still encountered in making an exact diagnosis between yellow fever and certain forms of paludic infection that in hot countries assume a very similar aspect and the serious character that is generally borne by that disease, so much so that even persons who are accustomed to observe the two affections are often uncertain as to the diagnosis. These doubts, the speaker hoped, would be dissipated in the future by the discovery of the yellow-fever microbe by Sanarelli. A knowledge of the cause of the disease will not only allow us to make an exact diagnosis, but will doubtless facilitate the means for attacking it in a certain manner.

Dr. Samuel H. Durgin, of Boston, spoke of the importance of closer and more careful bacteriological work in the study of yellow fever.

MR. J. W. HUGHES, of Montreal, read a paper on "The Drainage, Plumbing and Ventilation of Public and Private Buildings."

The author confined himself to the ventilation of the plumbing system of a building, or, more correctly, that part of a plumbing system which serves for the conveyance of the house wastes known as sewage, and that are to be finally disposed of, as far as any particular building is concerned, when they reach the public sewer. It was no more possible to lay down rules covering every possible contingency called for in scientific plumbing and ventilating than it was to apply fixed rules to the practice of medicine. The principles of scientific medicine and plumbing were fixed, but the application of these principles called for the intelligence acquired by education and developed by practice. Much injury had been done by attempting to frame plumbing by-laws which would apply to every

case. If the association would make a study of the general principles covering this question and embody them in a code having its endorsement, leaving the practical application of those principles to those whose special duty it is to apply them, much good would result.

AFTERNOON SESSION.

DR. JOHN L. LEAL, Health Officer of Paterson, N. J., read a paper on the same subject, in which he emphasized three points bearing upon the question of ventilation: first, that every building intended for occupancy should have some special means of ventilation; second, that these means should be commensurate with the requirements of any particular building; third, that the more simple and uncomplicated the means used the more successful was likely to be their operation. The object of plumbing is, first, the immediate withdrawal from a building of certain waste products of life, the presence of which would prove detrimental to health; and, second, to prevent harm to the inmates of the said building arising from these products after removal, through the means of their removal. Not only were we threatened by the presence of these substances, but we were also threatened by certain dangers inherent in the best system at our disposal for ridding ourselves of them.

"Report of the Committee on Car Sanitation," by Prof. S. H. WOODBRIDGE, of The Institute of Technology, Boston, was read by Dr. Durgin, in the absence of the author.

The author stated that something like interstate agitation and regulation were requisite to any legislative advancement in this field of hygienic improvement. The writer described a new type of improved parlor and sleeping car which had been devised.

EVENING SESSION.

At this session the public were invited. Prayer was offered by REV. WILLIAM N. MCVICKAR, D.D., of Philadelphia.

DR. BENJAMIN LEE, in the absence of Governor Hastings, welcomed the members and visitors on the part of the Commonwealth, and MAYOR WARWICK extended to them the hospitality of the city. The Mayor referred feelingly to the life-work of the late Dr. William H. Ford in the cause of municipal sanitation, after which the address of President Horlbeck was delivered.

ADDRESS OF PRESIDENT HORLBECK.

Speaking of the progress made in the study of disease, President Horlbeck said that the theory based upon the humors of the blood had given place to a knowledge of the denizens of the blood, which

were being recognized as surely as the flora and fauna of our fields. The microscope gave us the keynotes of our temporal welfare.

He gave a sketch of the association from its organization, in 1872, which he said had grown until there were now 1,844 names enrolled in its membership. During its existence some of the most important discoveries in the domain of medicine and surgery had been made, and the science of bacteriology had had its birth and development. Since the last annual meeting in Buffalo the method of diagnosticating typhoid fever, as discovered and described by Widal, of Paris, had been elucidated by Dr. Wyatt Johnston, of Montreal.

During the twenty-five years of the life of the association the process of taking care of contagious diseases had entirely changed. It was now an essential feature of practice in all communities to confine all such cases to the individual affected. He next dwelt upon the necessity for a pure water supply, and then passed on to the consideration of quarantine methods. He recommended a government commission on yellow fever. It is estimated that over 95 per cent. of all the yellow fever cases that had reached our shores had come from Havana. A committee of the association had been appointed to bring the vital question before the Government of this country, and urge the governments of the countries interested to prompt action in this matter. This would seem to be the occasion when not only the recommendations of the committee on yellow fever should be carried out, but that the association should make a demand on our general government to the effect that a commission of expert bacteriologists be sent to Havana and Rio, and be kept there until the *materies morbi* have been discovered, until the secrets of this dread disease have been unfolded. The examples of other countries in the solution of the problems involved in cholera, tuberculosis, bubonic plague and leprosy were noted; and why should we not solve the problems of yellow fever? He recommended that a committee from the association be appointed to wait upon the President of the United States to carry out this idea.

SECOND DAY—MORNING SESSION.

DR. CHARLES SMART, Assistant Surgeon-General U. S. Army, read the "Report of the Committee on Pollution of Water Supplies." The committee, he said, had been chiefly engaged in perfecting the stand and methods of bacteriological research. The

committee feels that it should be discharged from its duties, and that a new one should be appointed, which shall consist of a couple of men who are practically acquainted with municipal water supplies, a couple more who know effectively the chemical aspects of the subject, and finally a like number who know as it should be known the bacteriology of the subject. The committee had, however, announced the bacteriological formulæ for use in laboratories. In accordance with the suggestion the committee was discharged.

PROF. FRANKLIN C. ROBINSON, of Maine, spoke on the subject of *disinfectants.* He said he could not help noting how rapidly the knowledge and use of formaldehyd had spread. Only one year ago it was practically unknown in the United States. There was no apparatus for generating it in quantity except the one that was exhibited then. Now probably most, if not all, of the members had used it. He ventured to predict that we were far from knowing all about it, and that a year from now greater progress would be seen than during the past year.

DR. E. A. DE SCHWEINITZ, of Washington, D. C., followed with a paper on "The Determination of the Amount of Formaldehyd Yielded by the Formaldehyd Lamp."

PROF. S. BURRAGE, of Lafayette, Indiana, made some remarks on fumigation experiments with formaldehyd.

DR. FRANK W. WRIGHT, of New Haven, read a paper entitled "Diagnosis of Smallpox." He said an early diagnosis of smallpox was of great importance. Next to vaccination this is the most essential factor in preventing the disease from spreading. If by chance a health officer should fail to recognize a case of smallpox and the disease should spread, he would be subjected to very severe criticism and would likely be removed from his position in disgrace. On the other hand, if he should declare some disease that resembles modified smallpox as that disease and future events prove that a mistake had been made, he would be just as severely criticised, and would probably have to defend himself in a suit for damages.

AFTERNOON SESSION.

DR. A. WALTER SUITER, of Herkimer, N. Y., read a paper entitled "The Barber Shop as a Menace to the Public Health.' It seems that the time has arrived when the attention of public health authorities should be called to that part of hygiene which applies to the barber shop. The first attempt of modern times to regulate sanitarily the operations of the barber shop was recently made in

the city of Paris. As a public regulation and by direction of the sanitary authorities an order has been promulgated requiring that specific rules of asepsis and disinfection shall be observed in all shops for the protection of the public. One evening several years ago, a sheepish-looking individual shuffled his way into the writer's waiting room and requested a prescription. He was observed to be suffering from disease, and presented a most unattractive appearance; his face was literally covered with eruptions and his mouth and lips were ulcerous in a high degree with mucous patches. The man's case was disposed of, and he was gladly dismissed. Having to take an early train, Dr. Suiter shortly afterward proceeded to the barber shop to prepare for his toilet. His barber's chair was occupied and he sat down to await his call. As the occupant was about to rise he was startled to observe the very patient for whom he had prescribed an hour before. It is needless to say that he took his departure. Then and there he resolved that his face should never again be shaved by a barber.

PROF. LEONARD PEARSON, of Philadelphia, discussed the subject of "Meat Inspection."

Reference was first made to the amount of meat consumed by the various peoples of the world and to the methods of inspection followed in Europe and America. Since the bacterial origin of many diseases has been demonstrated, and the close relationship of many of the diseases of man and animals has been established, the importance of rational meat inspection has been greatly emphasized.

DR. EDWARD JACKSON, of Philadelphia, spoke of eye-strain from poor window-glass, and said the bad influence of defective window-glass was intensified by the eye having to look through different parts, causing different kinds of strain, so that the eye could not adjust itself so as to work with the best advantage. Even if the defects in the glass are comparatively slight, at a certain distance they will cause serious strain, similar to that of astigmatism.

DR. E. P. LACHAPELLE, of Montreal, followed with the "Report of the Committee on Transportation of Diseased Tissue by Mail," in which he said that the postal authorities of Canada had lately given their consent to the use of the mails for this purpose, this result being largely due to the valuable help received from the newly appointed Deputy Postmaster-General, who, being a physician, was quite *au fait* as to the importance of the demand. As

regards the United States, it may be said that since the use of the mails has been granted, the State Board of Health of New Jersey, at least, which has fully availed itself of the privilege, has not detected any case of infection traced to the circulation through the mails.

THIRD DAY—MORNING SESSION.

"The Committee on Health Legislation" proposed a bill to establish a Department of Public Health, the latter to be under the control and management of a Commissioner of Public Health, who shall be a regularly educated physician, appointed by the President of the United States, and whose term of office shall be six years.

SURGEON-GENERAL GEORGE M. STERNBERG, of Washington, spoke on the "Bacillus of Yellow Fever." He told how he had first discovered the bacillus of yellow fever while in Cuba in 1889, but was not satisfied at that time that it was the genuine yellow fever bacillus. Recently, when he read the statement of Sanarelli, Dr. Sternberg made a comparison of this bacillus with his own, and came to the conclusion that they were identical. If these two are proved to be the same Dr. Sternberg himself will lay claim to the title of discoverer.

DR. J. E. MONJARAS, of San Luis Potosi, Mexico, spoke on "The Necessity for Adopting an International Classification of the Professions."

DR. PETER H. BRYCE, of Toronto, read a paper in which he emphasized the view that in dealing with

"TUBERCULOSIS"

it is the duty of the State to do whatever can be done so well by the individual.

DR. SAMUEL W. ABBOTT, of Massachusetts, followed with a paper on "Consumption as an Indoor Disease," saying that no form of infection had been studied with greater interest during the past quarter of a century than that of tuberculosis. As proofs that consumption is an indoor disease, he first called attention to the evidence shown by occupations, and secondly, to evidence presented by the conditions of age and sex.

Col. GEO. E. WARING, JR., Commissioner of Street Cleaning, New York, read a paper under the title of "From Sewage to Drinking Water; a Study of the Natural Process of Sewage Puri-

fication and the Means Whereby Their Efficiency May Be Increased." He stated that the paper was written by his secretary, Mr. George Everett Hill, and that he presumed to read it because it fully set forth his own ideas, and because of the fact that it would never have been written had not its author been his secretary for many years.

The paper treated the subject exhaustively. The fact was made clear that no matter what the process of sewage disposal may be, sooner or later all the products of life-processes are subjected to the action of reducing agents, and are sent back to the storehouse from which they were originally drawn.

The discharge of sewage into the sea or into the strong, sweeping current of a great river (not used as a water supply) was advocated wherever circumstances make it possible, as the simplest and least expensive method of disposal. In the case of the majority of inland towns, where such a plan is not feasible, the question of the disposal of sewage becomes a grave problem, and under such circumstances a solution is to be found in the processes of biologic combustion. By furnishing conditions favorable to the rapid action of the natural purifying agents, the sewage of the largest city may be freed from all impurities, and the water which has been used and soiled may be passed on in a condition of purity fitting it for further use.

A description was then given of a sewage-disposal plant situated near Philadelphia, in which purification of sewage is accomplished by a process of screening, in which the material is finely divided, and filtering.

At the close of the morning session the members visited the Medico-Chirurgical College and Hospial of Philadelphia, where they were entertained at a luncheon, and were afforded an opportunity of inspecting the splendid new amphitheatre and the various appointments of the institution.

Dr. M. P. Ravenel, of Philadelphia, read a paper on "Tuberculosis and Milk Supply." He concluded his paper as follows:

"I have not covered all the evidence, but enough has been said, I think, to show the soundness of the conclusions arrived at by the Royal Commission on tuberculosis that as to the proposition of tuberculosis acquired by man through his food or through other means, we can form no definite opinion, but

we think it probable that an appreciable part of the tuberculosis that affects man is obtained through his food," and, "no doubt, the largest part of the tuberculosis which man obtains through his food is by means of milk containing tuberculous matter."

AFTERNOON SESSION.

DR. S. A. KNOFF, of New York, read a paper on "The Urgent Need of Sanatoria for the Consumptive Poor of Large Cities." The question what to do with the thousands of tuberculous patients who inhabit the tenement districts of our large cities, unconsciously disseminating the germs of their diseases among their own kin, friends and neighbors, or who crowd the wards of our general hospitals to the detriment and danger of the patients suffering from acute diseases, has become for the sanitarian one of the vital issues of the day. A number of well-known sanitarians were quoted as expressing the belief that the only solution of the question is the erection of special sanitariums under municipal control.

Two other papers were read on the subject of consumption. One dealt with bovine tuberculosis in its relation to the public health, and the other with tuberculosis and our milk supply.

DR. LAWRENCE L. FLICK, of Philadelphia, in discussing the papers on tuberculosis said that no hope of accomplishing great results could be looked for until the public was educated on the subject of the infectiousness of the disease. This education was going on, and in Philadelphia in the last ten years there had been a reduction of the disease by one-third.

DR. LYDIA RABINOWITSCH, of Philadelphia, told of the experiments which she had made in the past two years with butter and milk. In milk she had found from 20 to 30 per cent. of tubercle bacilli. In 18 samples of butter from different stores she had not found the bacillus of tuberculosis, but a micro-organism which very much resembled it.

DR. E. F. STEWART, of East Orange, N. J., presented a paper entitled "A Plan of Purifying Water."

MR. F. H. NEWELL, Hydrographer of U. S. Geological Survey, followed with a paper on "Investigations of Water Supply by the United States Geological Survey," which will appear in full in these pages at an early date.

H. W. CLARK, chemist in charge of the Lawrence Experiment Station, gave "A Brief Review of the Work of Sand Filters in Lawrence, Mass." In 1887 the deaths from typhoid fever at Lawrence

were 12 per 10,000; in 1889, 18.75; in 1890, 13.33; in 1891, 12.20; and in 1892, 11.11. During 1893 the filter was built, and hence during a portion of the year filtered water was being used. In 1894 filtered water was in use during the entire year, and the death-rate from typhoid fever was 5 per 10,000; during 1895 it was 3.07; during 1896, 1.86, and the rate for the present year promises to be exactly the same as for 1896.

FOURTH DAY—OCTOBER 29TH.

MORNING SESSION.

Officers were elected for the ensuing year as follows: President, Dr. Charles A. Lindsley, New Haven, Conn.; first vice-president, Dr. Benjamin Lee, Philadelphia, Pa.; second vice-president, Dr. John C. Shrader, Iowa City, Iowa; secretary, Dr. Chas. O. Probst, Columbus, Ohio; treasurer, Dr. Henry C. Holton, Brattleboro, Vt.

The following committee was appointed to investigate yellow fever: Drs. H. B. Horlbeck, Charleston; T. H. Durgin, Boston, Mass.; A. H. Doty, New York; G. M. Sternberg, U. S. A., Washington; T. R. Oliphant, New Orleans; R. H. Swearingen, Austin, Tex., and Prof. Isaac H. Hartzell, Canton, Ohio.

Ottawa, Canada, was decided upon as the next place of meeting.

The report of the committee on "Disposal of Garbage and Refuse" was then read, as on other pages of this number.

In the discussion which followed, the cremation of garbage was advocated by the majority of the speakers.

The report of the committee on the "Transportation and Disposal of the Dead" was read by Dr. Charles O. Probst, Secretary of the Ohio State Board of Health.

The report of the committee to "Examine into the Existing Sanitary Municipal Organizations of the Countries Belonging to the Association" was then read by Dr. Henry Mitchell, Secretary of the New Jersey State Board of Health.

AFTERNOON SESSION.

Dr. S. P. Heilman, of the State Board of Health of Pennsylvania, read a paper, entitled "Uniform and Co-Operative Health Laws," which was followed by one on "A Uniform Sanitary Law," by Dr. M. E. Wordin, of the State Board of Health of Connecticut, in which it was pointed out that the same necessity exists for uniformity in health and sanitary legislation as in criminal law.

A resolution in regard to the establishment of hospitals for consumptives was referred to a special committee.

DR. T. NEWTON SNIVELY, of Philadelphia, read a paper on "The Present Mortality Rate in Diphtheria."

NATIONAL BOARD OF HEALTH.

On motion of Dr. A. L. Gihon, Medical Director U. S. Navy (retired), a resolution animated by an apparently unfriendly feeling for the Marine Hospital Service, was adopted recommending the establishment of a National Board of Health with a politician for president.

THE SANITARY EXHIBIT.

Early in the process of the local committee of arrangements for this meeting a sanitary exhibit was undertaken.

Horticultural Hall, just across the street from the Hotel Walton, the place of meeting, was selected for the purpose, than which it would be difficult to find a better place, but either from lack of properly applied effort or lack of appreciation of the benefits to be derived from such an exhibit as it should have been, considering the fruitfulness of Philadelphia in sanitary appliances, and above all in her practical measures in domiciliary construction and appointments, the exhibit was surprisingly deficient. The few who did exhibit, however, expressed great satisfaction with the notice of the members of the association, and of the large number of Philadelphians who were attracted to the hall. Their exhibits were of general interest, and helped to attract attention to the meeting, and as the rental space must have paid the expenses of the hall the success of the venture fully justifies continuing it in connection with future meetings of the association.

The most important display of the exhibit was the collection of apparatus for the generation, or regeneration of formaldehyd gas for purposes of disinfection. On entering the exhibit hall the large collection of beautifully made generators exhibited by Eli Lilly & Co., of Indianapolis, was particularly striking. These generators are designed to generate the gas directly from its usual source—wood alcohol. The strong point in favor of these appliances is the comparative cheapness of the materials necessary to supply a given volume of gas.

Another prominent exhibit was that made by Fries Brothers, of New York, including a form of the Autoclave of Trillat for regenerating the gas under the pressure of two or three atmospheres (to prevent its polymerization) from formochloral, a solution free

from methyl alcohol which when present is liable to unite with the formaldehyd forming the comparatively inert methylal. This form of Autoclave is designed to be placed outside of the room to be disinfected, and where it can be properly watched and attended to, the gas being forced in through the keyhole.

Another of the large exhibits was made by H. K. Mulford & Co., including the formaldehyd regenerators manufactured by the Sanitary Construction Company, of New York, in which the formaldehyd solution is vaporized by passing through a tube heated to a temperature approaching 1,000° F., the heat being relied upon to prevent polymerization and the form of methylal.

Schering & Glatz, of New York, exhibited a small lamp and a large disinfector, which developed the formaldehyd gas directly by heat from the solid paraform, which is furnished in pastils of one gram each.

The Kny-Scheer Co., who make a form of Autoclave, were also represented in the exhibit. Another feature of the exhibit, which feature should in the future be developed into a very important one, was the display made by the Boards of Health. Those of Philadelphia, Brooklyn, New York and Pittsburgh were represented by apparatus for the bacteriological tests for diphtheria and for the practical analysis of water by photographs and blank statistics showing methods and results of their work.

Parke, Davis & Co., of Detroit, exhibited an interesting colection of tubes illustrating the appearances of pure cultures of pathogenic organisms and the preparation of anti-toxins. H. K. Mulford & Co. at their exhibit space arranged for excursions of all who cared to see the actual work of producing the diphtheria anti-toxin at their laboratories in the outskirts of the city. Seabury & Johnson, of New York, made a fine display of sanitary soaps. Schering & Glatz and Freis Brothers had similar displays. Chas. Lentz & Sons had a large exhibit of bacteriological apparatus, including microscopes, and showed centrifuges and other apparatus of interest. Hance Bros. & White, of Philadelphia, had a display of the veteran disinfectant phenol-sodique.

One of the most prominent, and from the educational point of view valuable exhibits, was made by the New York Publishers Association, under the inspiration of the chairman of the Committee on Literature of the Household Economics Association, Mrs. L. E. Hogan. This included a collection of books and other publications on hygiene, which, although evidently imperfect from lack

of time, was perhaps more complete than one could find anywhere else in the country outside of the few large libraries where the special works in question would be lost among thousands of others not related to the subject. This collection, we are informed, is the first attempt to bring together such works on hygiene as will be of the greatest interest to women whose attention is turned in this direction, a movement that must claim the hearty support of all sanitarians.

An exhibit of great interest to the health authorities of our large cities was made by the Pennsylvania Sanitation Co., showing their appliances for the purification of large water supplies, and the results achieved by their processes, which have recently been put in operation on a large scale at the city of Reading, Pa.

Perhaps the exhibit which received the most general and respectful attention was made by the veteran physician and sanitarian, Dr. J. Cheston Morris, who has for many years been engaged in supplying pure milk in the city of Philadelphia. Dr. Morris was in attendance much of the time to explain methods and results, without pushing any private interests; and his explanations and quiet enthusiasm must be counted as one of the best influences going out from the meeting to advance the cause of hygiene before the people. Supplementing that of Dr. Morris was the exhibit of Charles Hansen's Laboratory on Junket Tablets, and the manner of using them in the preparation of one of the oldest and most healthful foods. Some of the modern health foods were also represented by Horlick's malted milk and Eskay's aluminized food. The Hot Appliance Co. showed their apparatus for the application of continuous heat, and the Ammonol Co. exhibited "Ammonol," and C. Bischoff & Co. showed samples of "kryofin."

While there was a notable absence of scientific hygienic appliances in many directions, as for the disposal of garbage, new building materials, etc., the exhibit gave a promise of what good work the American Public Health Association might readily do by persistent effort in the way of educating the general public in regard to the application of new ideas to promote hygiene and public health.

Altogether, excepting Dr. Gihon's resolution, the meeting was an eminently successful one in the character of the subjects presented and discussed—evidently worthy of a larger attendance considering the enrolled membership, 1,844, of whom, with the addition of about sixty added at this meeting, there were only 177 in attendance.

Philadelphia was at her best—at least it is difficult to imagine a more whole-souled welcome and delightful entertainment. No effort seems to have been spared to make this silver anniversary of the association memorable. The committee of arrangements had so arranged the entertainments offered by the municipality and the citizens as to time and place as to have them interfere as little as possible with the scientific work of the association. On Tuesday, immediately after adjournment of the evening session, the delegates were invited to a "smoker" at the elegant club rooms of the Manufacturers' Club, on Walnut street.

On Wednesday luncheon was served in the foyer of Horticultural Hall by invitation of the Woman's Health Protective Association, at 1 P. M., while at 7 P. M. a most elaborate and enjoyable banquet by the municipality of Philadelphia was given at Hotel Walton. On Thursday, at 1 P. M., luncheon at the Medico-Chirurgical College, by invitation of the trustees, at which time opportunity was given the delegates to inspect the new surgical amphitheatre that has been recently completed on strictly sanitary principles, at a cost of $150,000. At 8 P. M. a reception by his honor, Charles F. Warwick, was given at the new City Hall. By invitation of the trustees of the University of Pennsylvania the meetings on Friday were held at Houston Hall, where luncheon was served at 1 P. M. After luncheon an opportunity was afforded for inspection of the Laboratory of Hygiene, the School and Hospital, the Hospital of Veterinary Medicine, the Biological Laboratory and other points of interest. On Friday evening a reception with music was given at the Academy of Fine Arts, corner of Broad and Cherry streets, on the part of the citizens of Philadelphia. On Saturday a trip down the Delaware on the United States revenue cutter Hamilton, the United States lighthouse tender Lizania, and the Sanitarium Association's boat, the John F. Smith, was tendered by the State Quarantine Board of Pennsylvania. The State Quarantie Station at Marcus Hook was visited and a luncheon was served at that place, the vessels then proceeded down the river and bay to Reedy Island, where the disinfecting plant of the United States Marine Hospital Service was inspected by invitation of Supervising Surgeon-General Walter Wyman. The vessels then returned to Newcastle, where a train furnished by the courtesy of the Pennsylvania Railroad Company conveyed the party back to Philadelphia. Through the courtesy of the H. K. Mulford Company tally-ho coaches conveyed the guests at their convenience through Fairmount Park, stopping to inspect the H. K. Mulford Co.'s Bacteriological Laboratory.

EDITOR'S TABLE.

SANITARIAN, DECEMBER NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed of the Editor, DR. A. N. BELL, Brooklyn, N. Y.

YELLOW FEVER.

According to the summary of the Mobile Register of Nov. 14, including the data of all the localities since the outbreak at Ocean Springs in June, up to and inclusive of Nov. 13, there had been 4,548 cases, with 407 deaths.

Writing under this head in October with special reference to this epidemic we stated the conditions common to yellow fever everywhere. To that statement the Southwestern Medical Record (Houston, Tex.), takes exception, because "if it were true malaria and yellow fever would go hand in hand on the Gulf Coast every year—a condition that by no means exists."

More knowledge of the natural history of yellow fever would show our esteemed contemporary that there is as yet some inexplicable condition with regard to the recurrence of yellow fever epidemics, in common with plague and cholera. These diseases severally are identified with the three great deltas, the Nile, Ganges and Mississippi, which annually inundate and contribute to the upbuilding of extensive regions and outlying islands, replete with vegetable matter in process of putrefaction, which under favorable climatic conditions renders them more or less liable to the diseases to which they are subject every year. Nevertheless, though apparently under the same conditions from year to year, and continuously maintaining the right of disease germs to live—a constant menace, but a no less constant admonition to mankind as an antagonizing force—the diseases thus perpetuated, even in their native regions, occur epidemically only at irregular periods, and sometimes with long intervals between, when not a single case occurs.

That the germs of yellow fever are in common with those of all infectious diseases, portable and liable to be introduced into places outside of, but which places are for the time being under conditions similar to, their usual habitat, is common knowledge perfectly consistent with the history of the disease wherever it is known to have prevailed.

The disease was recognized in Ocean Springs, this year, early in June. How it got there then became the absorbing question, while the people were purblind to the local conditions. "It must have come from somewhere else they proclaimed," or "it was not yellow fever at all—only dengue." But it so soon thereafter cropped out in, or spread to Biloxi, Mississippi City, Bay St. Louis and other places under similar conditions as to prove its genuineness; and ere long in New Orleans, Mobile and in other places superliable by reason of chronic local conditions and favorable weather.

There have been no developments with regard to this epidemic to weaken our contention at the meeting of the American Public Health Association at Richmond, in 1878, with regard to the epidemic of that year. At that meeting the commission appointed to investigate the source of the epidemic of 1878 reported (for adoption) "that yellow fever is a specific disease, not indigenous to, or originating spontaneously in the United States." . . . According to the minutes (Public Health, Vol. IV., 1878):

"Dr. A. N. Bell, of New York, opposed the adoption of this proposition on the ground that it was not sustained by the evidence." . . . He went on to remark, in substance as follows: "During my naval service in the Mexican War, and subsequently on the Gulf Coast, the Spanish Main, in the West Indies, on the coast of Africa and neighboring islands; and since, on Bay Ridge and at Fort Hamilton, in 1856; in charge of the Floating Hospital for the Care of Yellow Fever in the first year of the war, and my connection with the New York Quarantine—at home and abroad, ashore and afloat—I have, like my friend, Dr. Dowell, seen a good deal of yellow fever, and have had excellent opportunities for studying its topography in various places. And during the while I have read everything concerning it that I could get hold of, but with convictions the very opposite of his. I am thoroughly of the opinion that the conditions of yellow fever are, in general, putrefying organic matter, moisture, and high temperature; and wherever these conditions combine in the greatest abundance there yellow fever is most wont to prevail, and with the greatest degree of malignancy. And so far from having my convictions shaken in this regard by the reports we have heard here they have been greatly strengthened. Filthy soil, foul matter, foul traffic, foul vessels and high temperature have been the prevailing conditions throughout. And under these conditions, on evidence which I feel bound to accept, I believe the disease frequently has occurred *de novo* in

the United States. Of its history on this continent, and in the West Indies, it has been contemporary with European settlement. Oviedo records a great mortality from it among Columbus's people in San Domingo in 1494. Herrera, Ulloa, Ferreyra de Rosa and other Spanish and Portuguese historians, all make record of yellow fever in American settlements before there was any commerce between this country and Africa, or any other primitive source of this disease. And in more recent times, but yet so long ago that commercial intercourse was much more easily traced than during the last fifty years, yellow fever has occurred frequently in various parts of this country when favored by local conditions—in exceptional seasons—when it was wholly impossible to trace it to foreign origin; and under similar circumstances I hold that it is continuously liable to so occur."

The proposition was amended to read: "The yellow fever *of 1878* was a specific disease, not indigenous to or originating that year spontaneously in the United States," . . . and adopted. As much cannot be said, as yet at any rate, of the epidemic of 1897.

Particular examination of the localizing conditions in Memphis and New Orleans in 1879, where yellow fever still obtained, and of the shore of Mississippi Sound, where it has recently prevailed, and has been wont to prevail at intervals ever since the earliest record of the diseases of that region—1702—strengthened our conviction as above expressed.

By the *de novo* origin of the *fever* is not meant the *de novo* origin of its germs. It is upon the *continuous existence of the germs* or their spores in any place, that, under congenial conditions, the fever is ever liable to recur, even though at long intervals.

What the committee of the American Public Health Association, appointed at the recent meeting in Philadelphia, will accomplish, in addition to the information obtained from the committee report, 1878, is problematical only. Its chief purpose appearing to be to hunt for the germ which Saranelli claims to have already discovered. Meanwhile the medical and public press, and many medical societies are urging the establishment of a

"DEPARTMENT" OF PUBLIC HEALTH.

Foremost among the advocates of this measure is the Journal of the American Medical Association, edited by Dr. John B. Hamilton, the whilom Surgeon-General of the Marine Hospital Service, who while occupying that office vigorously contended against and

finally by the aid of political influence, overcame and supplanted the National Board of Health appointed by act of Congress and organized in 1879. The usefulness of that organization is better appreciated now than it was when Dr. Hamilton so successfully contended against it, hence the demand for a renewal with such a modification as will secure the co-operation of the State and local boards of health with the Marine Hospital Service, but not to overcome and supersede that service. Indeed, rather to extend its scope with special reference to the prevention of "shot-gun" quarantines and other needless obstructions to health, trade and commerce; but not after the manner suggested and advocated by Dr. Hamilton in the proposed bill, on other pages of this issue.

The tables are now turned, and Dr. Hamilton's ambition to supersede Surgeon-General Wyman is so great that he now advocates the subordination at least, if not the obliteration of the service, which, when he was chief of it, seemed to him amply sufficient to answer the needs of a national health service in all its details. To this end he prepared and secured the enactment of such laws as gave him power to contend against inland epidemics wholly apart from maritime quarantine regulations. Dr. Hamilton's administration of those laws, however, was not such as to win the approbation of the State and local sanitary authorities; and this circumstance perhaps he thinks sufficient to justify his changed attitude. Dr. Hamilton was not a member of the committee who formulated the bill referred to, yet it is scarcely less remarkable in its change of attitude, as the sentiment of the association, from the report Dr. Jerome Cochran, chairman of the committee, approved of the year before, than is Dr. Hamilton's. It is, to say the least, a remarkable coincidence. The title of the bill is wholly inconsistent with the subjacent text. It purports to be a "department," while it provides for a bureau. *It incorporates no additional function that is not already authorized by the laws governing in the Marine Hospital Service.* Excepting the concessions to State and local authorities to supersede or add to the provisions of the National quarantine laws, which concessions all competent observers now recognize as being accountable for the shot-gun quarantines and other needless obstructions to health, travel and commerce—barring these exceptions, for the repeal of which there is now a universal demand—the Marine Hospital Service, as at present organized and equipped, is competent to the exercise of every function provided for in the proposed bill.

As reported by Dr. Cochran to the A. M. Association, 1896:

"1. We may desire and advocate a plan to deprive the Marine Hospital Service of its public health functions, and for the establishment of an entirely new department; or,

"2. We may accept the Marine Hospital Service just as it stands as a department sufficient for our present use; or,

"3. We may endeavor to improve the Marine Hospital Service and make it a more satisfactory National Health Department than it now is.

"It would seem that this last method promises to be the most fruitful of beneficent results; and the question then arises as to the modifications that may be wisely made in the existing law."

Suggestions follow for utilizing the Marine Hospital Service as the groundwork for a national health service, with such amendments and additions to the laws governing it as would comprehend the co-operation of the State and local boards of health.

To this end there are no more experienced or better accomplished physicians in the United States, in both the theoretical and practical work necessary for an effective national sanitary service than are to be found in the medical corps of the Marine Hospital Service. Their scientific investigations in laboratory work will compare favorably with any that have ever been made elsewhere. These investigations relate to the cause, nature, history and prevention of epidemic diseases, and their practical utility in preventive medicine generally is of universal recognition. Moreover, admirably formulated regulations have been promulgated for the prevention of the spread of yellow fever and other infectious diseases from one locality to another. The collection of information regarding the prevalence of infectious and epidemic diseases generally, foreign as well as domestic, has been systematized, and is in practical operation; and State and local authorities are regularly supplied with such collective service by a weekly bulletin.

Indeed, the foundation of a national board of health is already laid. The proposition to extend its scope by such emendations and additions to the laws now governing it as would secure the co-operation of the sanitary authorities of the States severally and jointly, as suggested by the late Dr. Jerome Cochran, after a critical examination, is eminently commendable. And in this reference to the judgment of Dr. Cochran it should be borne in mind that it was the deduction of a practical sanitarian—of one who had devoted many years of his professional life to preventive med-

icine, and after he had, as chairman of a committee, specially appointed to consider the question of a "Department of Public Health.' Considering all the circumstances and the relations of the leaders of the proposition to supersede the Surgeon-General of the Marine Hospital Service, to the present chief of that service, we can but regard the proposition as being alike discreditable to both the American Medical and the American Public Health Associations.

The proposition reflects political preferment to practical knowledge of preventive medicine; it deserves not only the reprobation of every practical sanitarian, but of every person who is alive to the importance of an effective health service.

POSTSCRIPT.

WASHINGTON, November 15, 1897.

MR. EDITOR: Will you kindly permit me to correct a statement made in the editorial columns of your esteemed journal of the issue of November 11, 1897, under the caption, "A Department of Public Health." I refer to the statement in the second paragraph, which reads as follows: "The American Medical Association, at the Philadelphia meeting of this year, adopted a draft for a bill to establish a department of public health." I am informed by the Recording Secretary of the association and also by others who were present, that the American Medical Association did not adopt a draft for a bill to establish a department of public health.

The facts regarding the proposed bill, referred to in your editorial, are as follows: At the last meeting of the American Medical Association the Committee of the Association on Department of Public Health, through its chairman, Dr. U. O. B. Wingate, of Wisconsin, read a report of the committee, in which was included the draft of a bill providing for a department of public health. The report of the committee was received by the association, and the committee continued. As the proposed bill was presented during the last hours of the meeting of the association, when few were present, it was not discussed, adopted or rejected by the association. An opinion on the merits or demerits of the proposed bill was not expressed by the association. In fact, the American Medical Association, the year previous, at the Atlanta meeting, in adopting a report of its Committee on Department of Public Health, which report recommended that the committee be authorized to draft a bill which should be in accord with the recommendations of their report, expressed views which are entirely opposite to those embraced in the report of the committee at the last meeting, recommending the proposed bill for a Department of Public Health. It is proper to state that by reason of the death of Dr. Jerome Cochran, the chairman of the committee in 1896, a new chairman was appointed.

You are, undoubtedly, misled in the statement in your editorial by the editorial statement in the Journal of the Association, as was the case with some members present at the last meeting of the American Public Health Association. The statement that the proposed bill was adopted by the American Medical Association was announced at that meeting, which, undoubtedly, influenced members in voting for it. However, there were only nineteen votes for the bill, and seven against it at the meeting of the Public Health Association, whose average membership is about eight hundred.

Very truly yours,

H. W. AUSTIN, M. D.

[We find that the statements in regard to the American Medical Asociation contained in the above communication are substantially correct, and publish them with pleasure. Practically it seems to be a question whether the proposed Department of Public Health should swallow or be swallowed by the Marine Hospital Service.—ED.] From Boston Med. and Surg. Journal, Nov. 25, 1897.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrahams, M. D., Health officer.

Nov. 11—Yellow fever to this date: Cases, 335; deaths, 43; under treatment, 32.

CALIFORNIA.—C. A. Ruggles, M. D., President, Stockton; W. P. Matthews, M. D., Secretary, Sacramento.

San Francisco, 360,000. Report for September: Deaths, 464—90 under 5 years of age. From consumption, 63; acute pulmonary diseases, 53; from zymotic diseases, 41; diphtheria (and croup), 11; typhoid fever, 4. Annual death rate, 15.3. Contagious diseases reported during the month: Diphtheria, 41; scarlatina, 12; measles, 7. At a special meeting of the Board of Health October 14, Dr. A. P. O'Brien was elected Health Officer to fill the vacancy created by the death of Dr. A. S. Lovelace.

Los Angeles, 103,000. Report for September: Deaths, 88. From phthisis, 18; acute pulmonary diseases, 8. Annual death rate, 10.25. "N. B.—Of the 18 deaths from pulmonary consumption,

as follows: Natives of Los Angeles, 0; natives of the Pacific Coast outside of Los Angeles, 2; from other parts, 16. Of the 18 deaths 13 had lived here less than ten years."

COLORADO.—Denver, 160,000. William P. Munn, M. D., Health Commissioner, reports for September: Deaths, 136. Of these 36 were caused by consumption, 21 contracted elsewhere; 9 by acute pulmonary diseases. Annual death rate, 10.30 (excluding phthisis contracted elsewhere), 8.02.

Nov. 5—Diphtheria is raging in North Denver. Ten houses are quarantined within a radius of three blocks along Justina street and Bell avenue.

Colorado Springs—20,000. B. B. Glover, M. D., Health Officer, reports for October, 20 deaths, of which 5 were under five years of age. Annual death rate. 12.0 per 1,000. From typhoid fever, there were 2 deaths; from scarlatina, 0; from pneumonia, 0; from tuberculosis, 9.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Prof. C. S. Lindsley, M. D., Secretary, New Haven. The Secretary's bulletin for October comprises returns from every town in the State, representing a population of 883,192. There were 1,097 deaths reporetd during the month; 39 less than in September and 11 more than the average number of deaths in October for the five years preceding the present.

The death rate was 15.4 for the large towns; for the small towns 13.2 and for the whole State 14.9. Deaths from zymotic diseases, 185, being 16.8 per cent. of the total mortality. From diphtheria, 71; typhoid fever, 23; whooping cough, 9; scarlatina, 3; malarial fever, 12; consumption, 121; pneumonia, 74.

DISTRICT OF COLUMBIA, 276,963—88,176 colored.—Wm. C. Woodward, M. D., Health Officer, reports the mortality for five weeks ending October 30, 456. Of the decedents, 254 were white and 202 colored, the death rate being 13.9 for the white, 23.6 for the colored, and 18.8 for the whole population. The principal causes of death were: Zymotic diseases, 172; constitutional, 107; 59 were from consumption and 27 were from pneumonia. Of the zymotic class there were 24 fatal cases of diphtheria, 13 of typhoid fever, and 2 of whooping cough.

ILLINOIS.—L. Adelsberger, M. D., President, Waterloo; J. A. Egan, M. D., Secretary, Springfield.

Chicago, 1,619,226. A. R. Reynolds, M. D., Commissioner, reports for October: Deaths, 1,716; 599 under five years of age. From diphtheria, 61; typhoid fever, 61; consumption, 193; pneumonia, 134; bronchitis, 60. Annual death rate, 13.45.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

Evansville, Ind., Nov. 14.—An agitation has been started in Indiana to compel dairymen to furnish milk that is free from disease germs. The milk laws are lax in this State as compared with other States. In this city the Common Council has the matter in hand and a committee from that body is preparing an ordinance to be acted upon.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board Bulletin for July, reports since preceding: Diphtheria, 16 localities; scarlatina in 2; typhoid fever in 1.

Davenport, 35,000. W. L. Allen, M. D., Physician to Board of Health, reports for September 32 deaths—6 under five years of age. Zymotic diseases caused 7 deaths; consumption, 2.

KANSAS.—E. M. Hoover, M. D., President, Halstead; H. Z. Gill, M. D., LL. D., Secretary, Pittsburg.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. E. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored.

NOV. 12—Yellow fever to date—condensed report: total cases, 1,790; under treatment, 421; deaths, 259.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M. D., Health Commissioner, reports for September. The weather: The mean barometric pressure during September was 30.15 inches; mean temperature 69°; total precipitation 2.17 inches, a deficiency in precipitation during the month of 1.66 inches; prevailing direction of wind north.

Mortality, 760, a decrease of 7 compared with the corresponding month of September, 1896. Of this 599 were whites and 161 col-

ored; a death rate of 16.67 per thousand for the former and 25.77 per thousand for the latter. The death rate per thousand for the whole population was 18.22. 67 died from infectious diseases, 84 from consumption, 41 from pneumonia, 5 from enteritis, 17 from enterocolitis, 15 from Bright's disease, 34 from cholera infantum, 13 from diarrhoea, 36 from typhoid fever, 21 from gastroenteritis, 2 from cholera morbus, 16 from bronchitis, 23 from nephritis, and 8 from dysentery. 321 or 42.23 per cent. of the total deaths were in children under five years of age.

Cases of infectious diseases reported, 239, an increase of 35 compared with the preceding month.

One hundred and two deaths occurred in public institutions, of which 34 were reported as non-residents.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 516,305. Samuel H. Durgin, M. D., Chairman of Board of Health.

During the month of Sepetmber there were 885 deaths, of which number 357 were under five years of age. Annual death rate, 20.57 per 1,000. Deaths from diphtheria (and croup), 20; scarlatina, 2; typhoid fever, 27; cerebro-spinal meningitis, 12; consumption, 88. Cases reported: Diphtheria, 162; scarlatina, 58; measles, 19; typhoid fever, 94.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports for the month of October, 1897, compared with the average for October in the 11 years, 1886-1896, cholera morbus, cholera infantum, dysentery and pleuritis were more prevalent, and remittent fever, typhoid fever, consumption and intermittent fever were less prevalent. Including reports by regular observers and others, consumption was reported present in Michigan in the month of October, 1897, at 174 places; typhoid fever at 117 places; diphtheria at 58 places; scarlet fever at 56 places; measles at 28 places; whooping cough at 11 places and smallpox at 1 place.

Reports from all sources show consumption reported at 16 places less; typhoid fever at 3 places less; diphtheria at 7 places less; scarlet fever at 17 places more; measles at the same number of places; whooping cough at 9 places less and smallpox at 1 place more in the month of October, 1897, than in the preceding month.

At the State Capitol for the month of October, 1897, compared

with the preceding month, the prevailing direction of the wind was southeast (instead of southwest), the velocity was 1.9 miles per hour greater, the temperature was 10.22 degrees lower, the rainfall was 1.37 inches more, the absolute humidity was less, the relative humidity more, the day and night ozone less and the depth of water in the observation well was 4 inches less.

Compared with the average for October in the 11 years, 1886-1896, the prevailing direction of the wind was southeast (instead of westerly), the velocity was 1.1 miles per hour less, the temperature was 6.38 degrees higher, the rainfall was .27 of an inch more, the absolute humidity was more, the relative humidity less, the day and night ozone much less and the depth of water in the observation well was 5 inches less.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, reports for September: Total mortality, 390; 136 under five years of age. Annual death rate per 1,000, 13.67. Consumption, 14; pneumonia, 17; diphtheria, 14; scarlatina, 6. Cases reported: Diphtheria, 71; scarlatina, 40.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602. H. N. Avery, M. D., Commissioner, reports for September: Deaths, 150; 54 under five years of age. Deaths: Consumption, 19; typhoid fever, 9. Annual death rate, 8.05.

St. Paul, 215,582. A. J. Stone, M. D., Commissioner. Mortality for September: 128; 58 under five years of age. Deaths from diphtheria, 9; consumption, 25; pneumonia, 4. Annual death rate, 7.12.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Paul Paquin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for September: Deaths, 703; 225 under five years of age; from zymotic diseases, 142; diphtheria, 16; whooping cough, 4; typhoid fever, 17; phthisis, 64; pneumonia, 26. Annual death rate, 14.0.

Kansas City, 175,000. E. Von Quast, M. D., Health Officer, reports for September: Deaths, 126; 42 under five years of age. Deaths from typhoid fever, 6; phthisis, 6; tuberculosis, 4; pneumonia, 4. Annual death rate, 8.6.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Paterson, 108,268. J. L. Leal, M. D., Health Officer, reports for September: 132 deaths; 61 under five years of age. Annual death rate, 121. Deaths from diphtheria, 3; consumption, 14; pneumonia, 5.

Newark, 230,000. Health Officer Chandler reports for the five weeks ending October 30: Deaths, 331; 118 under five years of age: from diphtheria, 9; consumption, 47; pneumonia, 36; other respiratory diseases, 5. Annual death rate, 14.9.

Hudson County (Jersey City and vicinity), 355,231.—W. W. Varick, M. D., President.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for September reported that the mortality for the month exceeds the average of the past ten years by 400, but the increase is in local diseases, especially in those of the digestive, urinary and circulatory organs, the zymotic mortality being less than the average, as also that in early life, and from old age and unclassified causes, this comparative disease in deaths from preventable causes and among the feeble and susceptible showing the month to have been relatively healthful. Compared with the corresponding month of last year the number of deaths from all zymotic diseases is less, except from diarrhoeal diseases, which is increased, the death rate being 17.75 against 17.50 a year ago, and the infant mortality is greater. Compared with the preceding month of August there were 500 fewer deaths, the death rate being 17.75 against 18.75; the decrease is in diarrhoeal mortality and correspondingly in infant mortality. Of 1,810 deaths reported from zymotic diseases 1,170 were from diarrhoeal diseases; there has been an unusually large mortality from this cause in rural parts of the State, relatively almost equalling that of the urban; in the six larger cities there were 700 deaths from this cause, or 18 deaths per 100,000 population, while 240 deaths occurred in rural towns, representing 16 deaths per 100,000 population; a large number of deaths are reported from dysentery in country towns in various parts of the State, and recently in epidemic form in the town of Hartwick, Otsego County. During the past four months of diarrhoeal prevalence 5,870 deaths from it occurred, of which 4,135 were reported from the six large cities and 600 from rural towns representing nearly one-half the same population; the proportion of these deaths occurring in September was 17 per cent. in the cities and 39 per cent. in the country. Diphtheria is reported as prevalent

in 62 localities and there were 269 deaths, against 294 last September and 250 last month; there were but 10 deaths in country towns and 170 in the large cities. Typhoid fever is reported from 73 localities, and 157 deaths, of which 80 occurred in the large cities and 42 in rural towns representing less than one-half the population. The mean barometer for the month was 30.15, the mean relative humidity 71 per cent., the average mean temperature 61°, or 1° below the normal; there were 16 clear days and a rainfall of 1.35 inches against a normal of 3.15, with southerly and westerly winds of average velocity.

New York City, 1,995,000. Report for September: Deaths, 3,110; 1,363 under five years of age. Death rate, 19.70. Zymotic diseases per 1,000 from all causes, 175; diphtheria, 89; typhoid fever, 32; cerebro-spinal fever, 16; consumption, 390; acute respiratory diseases, 375; diarrhoeal diseases, 347.

Brooklyn, 1,100,000. Report for September: Deaths, 1,776; 819 under five years. Death rate, 19.58. From zymotic diseases, per 1,000, from all causes, 192; diphtheria, 60; typhoid fever, 32; consumption, 166; acute respiratory diseases, 154; diarrhoeal diseases, 208.

Buffalo, 360,000. Report for September: Deaths, 352; 170 under five years. Death rate, 11.7. From diphtheria, 10; acute respiratory diseases, 31; consumption, 32; typhoid fever, 5.

Rochester, 170,000. Report for September: Deaths, 154; 37 under five years. Death rate, 10.8. From consumption, 22; acute respiratory diseases, 9.

Albany, 100,000. Report for September: Deaths, 145; 26 under five years. Death rate, 17.4. From typhoid fever, 10; diphtheria, 6; consumption, 16; acute lung diseases, 8.

Syracuse, 120,000. Report for September: Deaths, 121; 37 under five years of age. Death rate, 12.1. From diphtheria, 2; acute respiratory diseases, 5; consumption, 17.

NORTH CAROLINA.—George G. Thomas, M. D., President, Wilmington; Richard H. Lewis, M. D., Secretary, Raleigh.

The September Bulletin summarizes the mortality for August, from twenty towns, with an aggregate population of 99,384—43,417 colored.

Total number of deaths, 145, of which 86 were of colored people and 50 under five years of age. Typhoid fever caused 3 deaths; malarial fever, 18; whooping cough, 6; consumption, 14; pneu-

monia, 2; diarrhoeal diseases, 22. Annual death rates—whites, 12.6; colored, 24.4; total, 17.5.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 405,000. J. M. Withrow, M. D., Health Officer, reports for September 412 deaths; 148 under five years of age. Annual death rate, 12.20. From consumption, 55; pneumonia, 21; bronchitis, 11; zymotic diseases, 60; diphtheria, 10; typhoid fever, 9.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports for the month of September: Deaths, 403; 181 under five years. From diphtheria, 5; typhoid fever, 4; consumption, 23; tuberculosis, 15; pneumonia, 23; bronchitis, 8. Death rate, 13.8.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,214,256. Theodore B. Stulb, Health Officer, reports for the five weeks ending September 30: Deaths, 1,804; 539 under five years of age. From diphtheria, 176; typhoid fever, 234; consumption, 208; pneumonia, 131; scarlatina, 14. Annual death rate per 1,000, 11.09.

Nov. 17—Diphtheria in the 33d and 37th Wards, covering a period of seven weeks, there have been reported 152 cases, of which over 50 were removed to the hospital. The type of the disease thus far has been extremely mild. There have been but 11 deaths, giving a death rate of about 7 per cent., while the mortality rate of the same disease during the corresponding time was over 25 per cent. throughout the entire city.

Nov. 1—9. Diphtheria reported prevalent in Nanticoke, Pittsburg, Union Hill, Ringoes and Lebanon.

Pittsburg, 285,000. Report for the five weeks ending October 30: Deaths, 429; 152 under five years of age; typhoid fever, 21; consumption, 24; diphtheria, 17. Death rate, 15.4.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for five weeks ending October 30: Deaths, 141; 104 colored. Under five years of age, 47. Annual death rate—white, 13.3; colored, 29.7—21.5.

TENNESSEE.—J. A. Albright, M. D., President, Somerville; J. Berrien Lindsley, M. D., Secretary, Nashville.

Bulletin for August-September, reports: Yellow fever and filth go hand in hand, and where the sanitary arrangements are good there is no more danger from this than from any other fever. Assuming that the cases at New Orleans, Ocean Springs, Biloxi, and Bobile are genuine yellow fever, we see how innocuous it is where the surroundings are comparatively clean. Memphis cleaned up thoroughly after the epidemic of 1878 and 1879, and adopted a scientific sewer system, with the result that not a single case of yellow fever has ever appeared here since. (A few cases occurred subsequently.) The health boards in the various towns of the South have been frantically drawing up quarantines against each other, and the thing for them to do is to manifest hereafter some activity in having their towns thoroughly cleaned. Hardly a year passes that some cases of yellow fever do not slip into our Southern ports. If they find a nidus of filth to feed on, they spread. The authorities of every Southern town should realize the fact that there is one sure preventive of epidemic, and that is sanitation. Instead of sleeping throughout the year, and then hoping to meet the emergencies by drawing up a quarantine, they should adopt an effective system of cleanliness. They should devote themselves to sanitation first and in preference to all other public work. Better a clean town than anything else. It ought to be a crime for any town to be dirty. Let the good work begin now, and keep it up throughout the year.—Commercial-Appeal, Sept. 23.

TEXAS.—R. M. Swearingen, M. D., State Health Officer, Austin.

Galveston, Texas, October 16.—Whereas, after having heard a full explanation of the prevailing epidemic now in Galveston, and also a thorough explanation of the courses and results of all the suspected cases of yellow fever, as diagnosed by Drs. Guiteras and Swearingen and some of the local physicians, we, the visiting physicians of the interior of Texas, resolve that WE DO NOT BELIEVE THAT THERE IS A CASE OF YELLOW FEVER IN THE STATE OF TEXAS.

Resolved, further, That WE DO NOT BELIEVE THERE HAS BEEN A CASE OF YELLOW FEVER IN THE STATE OF TEXAS WITHIN THE PAST TWELVE MONTHS. While we believe that Drs. Guiteras and Swearingen and others who have made diagnoses of yellow fever in Galveston and Houston were honest and conscientious in their diagnosis, the results have not borne out such diagnoses; be it further

Resolved, That we are unanimously of the opinion that dengue—

the disease now prevailing as an epidemic in Galveston and Houston—now exists also as an epidemic throughout the entire State of Texas.

J. F. Collier, M. D., Health Officer Montgomery County; J. E. Vann, M. D., Health Officer Trinity County; J. S. Wooters, M. D., Crockett; C. I. Holt, M. D., Kilgore; Lawrence Corley, M. D., Crockett; F. C. Woodward, M. D., Grapeland Board of Health; W. N. Hooper, M. D., Conroe; G. S. West, M. D., Palestine; W. G. Jameson, M. D., Palestine, Chief Surgeon International and Great Northern Railroad: J. L. Hall, Crockett; G. L. Davis, Trinity.

UTAH.—Salt Lake City, 48,076. W. T. Dalley, M. D., Commissioner, reports for September 47 deaths, of which 15 were under five years of age. Annual death rate per 1,000, 8.04. From zymotic diseases, 12; consumption, 3; cholera infantum, 6.

WASHINGTON.—Seattle, 60,000.—R. M. Eames, M. D., Health Officer, reports for September 36 deaths. Annual death rate per 1,000, 7.2. Deaths from consumption, 2; pneumonia, 1; typhoid fever, 4.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 275,000. Walter Kempster, M. D., Commissioner of Health, reports for September: Deaths, 300; 141 under five years of age. Annual death rate per 1,000, 130. Diphtheria caused 7 of age. Annual death rate per 1,000, 13.0. Diphtheria caused 7

MEXICO.—Cousejo Superior de Salubridad. Dr. Eduardo Licéaga, President, Mexico; Dr. José Ramirez, Secretary-General.

City of Mexico, 344,377. Bulletin reports for the month of September, 1,327; from diarrhoeal diseases, 352; tubercular diseases, 138; pneumonia, 84; bronchitis, 83; typhus, 47; smallpox, 19; other causes, 604. Annual ratio per 1,000 population, 46.50.

BUENOS AYRES, 725,554. A. B. Martinez, Director of the Municipal Statistics Bureau, reports for the month of June 1,113 deaths, of which 411 were under five years of age. Annual death rate, 18.4 per 1,000. From diphtheria there were 22 deaths; typhoid fever, 30; acute lung diseases, 237; consumption, 99.

For the month of July 1,346 deaths, of which 515 were under five years of age. Annual death rate, 22.2 per 1,000. From diphtheria there were 21 deaths; typhoid fever, 16; acute lung diseases, 375; consumption, 130.

CONTEMPORARY LITERATURE.

THE RELATION OF STRUCTURE AND FUNCTION.

Reproduction and dispersal are the two great aims in the life of every plant and animal. All else is but the means, the mere contrivances to gain the best advantage in the accomplishment of these ultimate efforts. Every species, every individual exists by virtue of having striven to attain these ends. In the structure of each one is the record of the attainment, partial or complete, as the case may be. And each man and woman of us is toiling in his or her way toward the same goal, unconscious of that something within us, greater than ourselves, that "guides us, blindfold but safe, from one age on to another." The burs and "stickers" that cling so persistently to our clothes are but a part of the same great effort. It is the only way sweet cicely, desmodium, the bur-marigold, and their kin have of traveling through the woods, and so on from forest to forest, from swamp tangle to swamp tangle. They live their lives as truly as a man lives his, with equally as good a purpose that is equally as well attained. Each embodies those essential qualities of living that the great teacher discerned when he bade men "consider the lilies of the field."—From Burs and Beggar's Ticks, by Prof. S. Trotter, in Appletons' Popular Science Monthly for November.

LEPROSY AN EXCLUSIVELY HUMAN DISEASE.

The active cause of leprosy is a specific micro-organism, the bacillus lepræ. The period of incubation varies from a few minutes to several years.

Leprosy is an exclusively human disease; it is not inoculable to animals. It is never of spontaneous origin, but is invariably derived from the lesions or secretions of a person similarly diseased. Its development in a country previously exempt from the disease may always be traced to its importation in the person of a leper from an infected centre. We know nothing definitely of the mode of infection or the channels of entrance through which the bacillus gains access to the organism—whether by direct contact, by inhalation or imbibition of the germs, or by other intermediaries. Observation proves conclusively that every leper is a possible source of danger to all with whom he may come into intimate and prolonged contact. —From "Leprosy and Hawaiian Annexation," by Dr. Prince A. Morrow, in North American Review for November.

A GREAT AUTHORITY ON EVOLUTION.

There is a sketch of "A Great Naturalist," the late Edward Drinker Cope, in the November Century. It is written by Henry Fairfield Osborn. Prof. Osborn says: "His pioneer exploration came early in the age of Darwinism, when missing links, not only in the human ancestry, but in the greater chain of backboned animals, were at the highest premium. Thus he was fortunate in recording the discovery in Northwestern New Mexico of by far the oldest quadrupeds known, in finding among these the most venerable monkey, in describing to the world hundreds of links—in fact, whole chains—of descent between the most ancient quadrupeds and what we please to call the higher types, especially the horses, camels, tapirs, dogs, and cats. He labored successfully to connect the reptiles with the amphibians, and the latter with the fishes, and was as quick as a flash to detect in the paper of another author the oversight of some long-sought link which he had been awaiting. Thus in losing him we have lost our ablest and most discerning critic. No one has made such profuse and overwhelming demonstration of the actual historical working of the laws of evolution, his popular reputation perhaps resting most widely upon his practical and speculative studies in evolution."

DANGERS OF LUMBERING.—Death is always near at hand, and usually in a dreadful form.

"The Story of a Pine Board" is the title of an article by W. S. Harwood in the November St. Nicholas. Mr. Harwood says:

The train draws the logs to the landing, which may be a hundred miles from the place where our pine was felled. The landing is the bank and surface of a large river, the Mississippi in its upper course affording fine landings.

Death is near at hand at the landing; indeed, it is near at hand always among the lumbermen from the time the tree is selected by the under-cutter until its gets the last touch of the picaroon and is piled up in the lumber yard of city or town. In felling the trees, in loading them upon the big sledges, in rolling them down the skidways at the landing, on the drive down the river, in the mills, death comes often, and usually in a dreadful form. The landing is a particularly dangerous place. When the train-loads of logs are dumped from the wide cars, they tumble down an immense skidway, perhaps sixty feet long—an incline reaching to the ice-covered river. Load after load of logs is thrown down upon the ice, until

the river is covered for a city square in width, and the logs extend perhaps a quarter of a mile away. There is thus an immense weight upon the ice, and the logs frequently press down so heavily that they crush through it, and at last rest upon the bottom of the river bed. The logs may be piled up perhaps twice as high as an ordinary city dwelling house, over a hundred feet.

While the men are unloading the logs from the trains there is great danger that a "chaser" may get after them—that is, a log which suddenly springs down from the load, where it has been held by a chain, and, without warning, tumbles down the declivity of the skidway at a tremendous rate of speed. Woe to the logger who stands in the way of the chaser! Once in a while it may be necessary to dislodge a log which has become wedged in such a way among the other logs in the mass on the skidway that it must be released to allow the others to move. Getting out this log is called "killing the Dutchman." The men who clamber down the skidway, aided by their sharp-pointed peavies and cant-hooks, take their lives in their hands many a time when they go to dislodge this log—the key to the situation. Oftentimes when such a log is wedged into a great jam in the middle of the river after the spring drive has begun, dynamite must be used in dislodging it, so great is the pressure of the thousands of logs above it. "Killing the Dutchman" under such circumstances is a novel as well as dangerous act.

CHICAGO'S GREAT DITCH.

The city of Chicago is so remarkable in every way that we have ceased to view with surprise any undertaking which it may assume. After its White Wonder, risen like a dream from out of a bleak morass; after its thirty-story sky-scrapers floating on the unstable foundations of a bog, we can in no wise marvel that it should build a drainage sewer to carry a volume of water as large as the Ohio River, and costing $30,000,000.

But the import of the Chicago Drainage Canal has been obscured by its name. Few, besides engineers, realize that its unique contrivances, its monster machines and novel methods of construction, were to show this nation how it might be possible to build a canal which would carry a boat from New York, at the mouth of the Hudson, 2,000 miles inland, to the base of the Rocky Mountains.

Primarily it will be Chicago's harbor. It will be 28 miles long, and with a depth of 26 feet and a surface width of 300 feet it will ad-

mit any vessel which sails these inland seas. The canal is in reality a huge artificial river. Its functions as a sewage carrier promise to become as relatively unimportant to its larger use for the purpose of navigation as the Mississippi at St. Louis or the rivers which wash Manhattan.—"From the Lakes to the Sea," by Carl Snyder, in American Monthly Review of Reviews for November.

MODERN EDUCATION.—Those nations in modern Europe which have gone furthest in recent years towards dissociating religion from secular instruction, those who have thought that intellectual enlightenment was in itself, if widely diffused, sufficient to secure a nation's well-being—I may cite as instances France, Italy, Greece—have shown, by the rapid deterioration of their public morality, that even, as in the individual, talent without character is little worth, so in the nation, it is the moral standard, rather than the intellectual which will determine its progress or decay. The words of the Hebrew sage are not yet antiquated: "Righteousness exalteth a nation, but sin is a reproach to any people."—From "Modern Education," by Prof. Mahaffy, in the Nineteenth Century for November.

CUBA.—Seldom has a periodical the privilege of publishing so important an article as that which Mr. Hannis Taylor, late American Minister to Spain, contributes to the November number of the North American Review. The subject is one of the greatest international moment, and Mr. Taylor is everywhere recognized as the man best qualified to throw conclusive light upon it.

THE CENTURY MAGAZINE, with its November number, entered upon its twenty-seventh year. During its long existence, by reason of its many notable successes, it has won an assured and commanding position. During the coming year The Century will maintain its exceptional position as a magazine of entertainment and as a leader in art and thought.

For the benefit of readers of The Century an unusual combination offer is made for this year. There has been issued "The Century Gallery of One Hundred Portraits," made up of the finest engravings that have appeared in the magazine, and representing a total expenditure of nearly $30,000. These are printed on heavy plate paper, with wide margins, like proofs. The retail price of the gallery is $7.50, but this year it will be sold only in connection with a subscription to The Century, the price of the two together being $6.50.

"The Adventures of François," the new novel by Dr. S. Weir Mitchell, author of "Hugh Wynne, Free Quaker," will begin in the January Century.

ST. NICHOLAS, conducted by Mrs. Mary Mapes Dodge, entered upon the twenty-fifth year of its successful career as the leading magazine for boys and girls with its November issue. A remarkably varied and attractive list of features has been secured for the coming year, including contributions by several of the foremost writers of the day. There will be the usual number of articles of instruction and entertainment, short stories, poems and jingles, as well as hundreds of pictures by leading artists. The price of St. Nicholas is 25 cents a copy, or $3.00 a year.

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Twenty-eighth Annual Report of State Board of Health of Massachusetts.

Twenty-seventh Annual Report of the Sanitary Department of the City of Glasgow.

Manuel Du Genie Sanitaire-Laville Salubre. M. Barre, Paris.

Stirpiculture. M. Holbrook, New York.

Color-Vision and Color-Blindness. Jennings, Philadelphia.

Annual Report, Bureau of Health, Pittsburgh, Pa.

Treatment of Malaria. J. Doland, Philadelphia.

Effect of Kindergarten Work on the Eyesight of the Children. C. A. Wood, New York.

Vaginal Incision and Drainage of Suppurating Harmatoceles due to Ectropic Gestation. C. P. Noble, Philadelphia.

Clinical Report on the Course of Pregnancy and Labor as Influenced by Suspensio Uteri. C. P. Noble, Philadelphia.

Movable Kidney. C. P. Noble, Philadelphia.

Contributions to the Technique of Operations for the Cure of Laceration of the Pelvis Floor in Women. C. P. Noble, Philadelphia.

Ectropion of the Cervix in Nulliparae Resembling Laceration of the Cervix. C. P. Noble, Philadelphia.

A New Method of Suturing the Abdominal Wall in Celiotomy. C. P. Noble, Philadelphia.

Development and the Present Status of Hysterectomy for Fibromiformata. C. P. Noble, Philadelphia.

Use of the Buried Suture in Abdominal Surgery. C. P. Noble, Philadelphia.

Vaginal Hysterectomy. C. G. Davis, Chicago.

Meterological Conditions of Sunstroke. W. F. R. Phillips, Washington.

Stricture of the Urethra in Male Children. L. B. Bangs, New York.

Treatment of Convergent Strabismus in Children. L. A. W. Alleman, Brooklyn.

Recurrent Gall Stones. J. Homans, Boston.

Treatment of Hepatic Abscess. G. B. Johnston, Richmond.

Comparative Frequency of Stone in the Bladder in the White and Negro Races. G. B. Johnston, Richmond.

Value to the Public of State Medical Societies. G. B. Johnston, Richmond.

Acquired Umbilical Hernia in Adults. G. B. Johnston, Richmond.

Splitting the Kidney Capsule for the Relief of Nephralgia. G. B. Johnston, Richmond.

Stone in the Kidney. C. R. Robins, Richmond.

Retirement of Dr. C. F. MacDonald from the State Commission Shurly, Detroit.

Present Status and Prospects of the Art of Medicine. E. L. Shurley, Detroit.

Questions Concerning the Epiology and Prevention of Consumption. E. L. Shurly, Detroit.

Scientific Investigation of Insanity. C. F. MacDonald, Albany.

A Criticism of Modified Milk. R. C. Newton, Montclair, N. J.

Some Personal Observations Upon the Effects of Changes of Climate Upon Men and Animals. R. C. Newton, Montclair, N. J.

Is There Ever a Serious Iritis Without an Involvement of the Ciliary Body, or Choroid, or Both? W. Cheatham, Louisville.

Technique of Abdominal Hysterectomy. J. F. Baldwin, Columbus, O.

Work of the Medical Department on Board U. S. Naval Vessels. C. A. Siegfried, Newport, R. I.

Syphilis Successfully Treated by Hydriatics. E. Lee, New York.

List of Publications of the U. S. Geological Survey, Washington.

Water Supply and Irrigation Papers of the U. S. Geological Survey—Windmills for Irrigation No. 8. Irrigation near Greeley, Col., No. 9.

The Sanitarium Treatment of Phthisis. C. F. McGahan, Aiken, S. C.

Ophthalmology. J. E. Willetts, Pittsburg.

State Medicine to the Present Time. F. Staples, Winona, Minn.

Report of the Commission of Health of Milwaukee.

INDEX.

Absent-Mindedness, Prof. Sylvesters, 52.
Aerotherapeutics and Hydrotherapeutics in Tuberculosis, Knoff, 24.
Age, Old, 379.
Alaskan Natives, Muir, 281.
Aluminum, How is Made, 478.
Ambler, Institution Treatment of Tuberculosis, 28.
Animals, Humanity and Experiments on, 346.
Antikamnia, 57.
Ants, Bees and Wasps, 187.
Arason, Hans, Formaldehyd Gas Disinfection, 498.
Armamentarium, Physicians and Their, Tanner, 97.
Asheville (N. C.), Water Supply, 275.
Associations, Conventions, etc.:
American Climatological Association, 17; American Medical Association, 189; American Pediatric Association, 384; American Public Health Association, 189, 375, 531; Civic and Philanthropic Conference, 288; Mississippi Valley Medical Association, 288; National Conference of State Boards of Health, 192, 374; Sanitary Institute of Great Britain, 375.
Austin, A., Victoria the Good, 89.
Babcock, R. H., M. D., Some Points in the Management of Consumption. 89.
Bashore, H. B., M. D., Village Sanitation, 315.
Bath, Improved Kind of, 327.
Bathers' Cramp, 231.
Bathing, Surf, and Swimming, Holland, 226.
Baths Under the Bridge Arches, 259.
Beasts, the Law of, Greenwood, 480.
Bell, A. N., A. M., M. D.,
Practical Sanitation, The Bane of, 450.
Topography, Climate and Mineral Springs of Michigan, 113.
Topography, Climate and Mineral Springs of Minnesota, 321.
Topography, Climate and Mineral Springs of Wisconsin, 205.

Yellow Fever, 359, 450, 545.
Bicycle Accidents, 176.
Biggs, H. M., M. D., Preventive Medicine in New York, 385.
Bonny, S. G., M. D., Observations Upon Tuberculosis in Colorado, 26.
Book Reviews:
Alcoholism, Fellows, London, 477; American Journal of Physiology, 384; Bureau of Animal Industry, 87; Electro-Therapeutic Guide, Park, 476; Eye-Strain in Health and Disease, Ramey, 179; Georgia Journal of Medicine and Surgery, 287; High Altitudes for Consumptives, Tussey, 182; Hypnotic Magazine, 88; Illinois Society of Engineers' Report, 379; Living Age, 96, 188, 383, 480; Medical Climatology, Solly, 85; National Hospital and Sanitarium Record, 384; National Waste and Utilization Company, Douglass, 183; Open Court, 96; Pioneers of Evolution, Clodd, 85; Popular Science Monthly, 91; Proceedings of Connecticut Medical Society, 378; Report of Commissioner of Education, 477; Review of Reviews, 187, 479; Smithsonian Institution Report, 377; Transactions of the Medical Society State of New York, 378; True to Themselves, Skene, 376; Typhoid Fever and Its Abolition, Woodbridge, 476; Weather, The, Washington, D. C., Gov't. Print., 181.
Boylan, G. D., The Mine, 348.
Brown, S., M. D., Diseases of the Nervous System Affected by Climate, 21.
Bryn, H., M. D., Tubercle Bacillus, 280.
Buenos Ayres, Vital Statistics of, 83.
Burns, Milk Dressing for, 258.
Castile Soap and the Plague, 155.
Century, The, 564.
Cerebro-Spinal Meningitis, Treatment of, 57.
Chicago's Great Ditch, Carl Snider, 663.
Children Learn, What Should, Small, 91.
Cleanliness, Honesty and, Brooklyn Eagle, 496.
Climate and Health, the Resumption of, Resolutions Requesting, 29.
Climate, A, Where No Rain but Snow Only Falls, 264.
Climate, Diseases of the Nervous System Affected by, Brown, 21.
Climate, Effects of Changes of Upon Men and Animals, Newton, 26.

Climate, Height and Distance from Sea Affecting, 132.
Climate of Hawaii, Nichols, 282.
Climate or Environment as a Factor in the Repair of Neurasthenia and Melancholia, Taylor, 21.
Climate, Topography, and Mineral Springs of Michigan, Bell, 113.
Climate, Topography and Mineral Springs of Minnesota, Bell, 321.
Climate, Topography and Mineral Springs of Wisconsin, Bell, 205.
Clothing and Temperature, 435.
Coffee, the Medicinal Employment of, 349.
Consumption, Some Points in the Management of, Babcock, 22.
Corbally, T. P., A. M., M. D., Koch's Improved Tuberculin, 35.
Medical Excerpt, 53, 152, 255, 352, 444.
Cordeiro, F. J. B., Thermics and Thermo-Dynamics of the Body, 3.
Coxe, N. D., M. D., Scarlet Fever and Sanitation, 137.
Cream for the Sick, 64.
Crete and Its Natives, Kalopthakes, 95.
Cuba, 373, 564.
Cuban Shame, the, America's Share in, Bonsal, 95.
Curtain, R. G., M. D., Clinical Study of Tachycardia, 34.
Cure, that Proverbial, 112.
Cyst of the Liver, Hydatid, Boinet, 356.
Deaf Mute Education, 185.
Dangers of Lumbering, W. S. Harwood, 562.
Demerara, Mortality in, 177.
Department of Public Health, Proposed Bill for, 509, 547.
Diabetes, Pavy, 444.
Digestion *vs.* Drugs, Fisk, 23.
Diphtheria, Souvestre, 255; Statistics of, 155.
Diphtheria and Unsanitary Conditions, Mivart, 412.
Diphtheria, Calomel in, Judd, 32.
Diphtheria from Chewing Gum, 158.
Disease Prevention in New Jersey, 41.
Disinfectants, De Buck, 258.
Disinfection by Vapor of Phenols, Johnson, 319.
Diuretin, 58.
Disposal of Garbage and Refuse, Rudolf Herring, 485.
Drinks, Warm, Action of, Montagnon, 354.
Drunkards, How, are Treated in Denmark, 63.
Dust and Dirt, 259.
Eczema, Picric Acid in, Gaucher, 56.
Egg Structure and the Heredity of Instincts, Loeb, 186.

Electricity, Hygienic Benefit from, 334.
Electric Power and Light from City Refuse, Kelvin, 313.
Eliot, C. R., The Temperance Problem, 237.
Elsner, H. L., M. D., Vagaries of Croupous Pneumonia, 29.
Enetro-Colitis, Acute, Briggs, 53.
Epilepsy, Disturbance of Sleep in, Nevsky, 352.
Evolution, A Great Authority on, Edward Dinker Cope, Prof. Osborn, 562.
Eyes, How Children's Should be Tested, Allport, 93.
Fahrenheit, To Convert, to Centigrade, 16.
Fat Producer, a, Indolence as, 357.
Feeding of the Child, Imperfect, 380.
Fever, Curative Action of, Righter, 257.
Fields, R. McC., Sing a Song, 236.
Fisk, S. A., M. D., Digestion *vs.* Drugs, 23.
Flat Foot, Painful, Bloch, 152.
Fletcher, R., Public Rights *vs.* Personal Liberty in Health Affairs, 166.
Footed the Bills, 34.
Formaldehyd as a Milk Preservative, Hurty, 317.
Formaldehyd Gas, 59; Method of Disinfection with, Arason, 498.
Garbage and Refuse, Disposal of, Rudolf Herring, 485.
Garbage, Sanitary Disposal of, Pierce, 299.
Gardiner, C. F., M. D., Dangers of Tuberculous Infection, 28.
Gas Stoves, Trials of, Von Ihering, 438.
Gout, Treatment of by Natural Mineral Waters, Ransom, 30.
Hæmoptysis, Salicylate Treatment of, Mays, 32.
Hamilton, J. B., M. D., LL.D., The Prevention of Tuberculosis, 193.
Hawaii, The Varied Climate of, Nichols, 282.
Health, "Department" of Public, Proposed, 509.
Health and Economics, Van Voorhis, 133.
Health, Public, Clean Streets and, 473.
Heredity Run Mad, 345.
Heredity, The Mystery of, 358.
Hernia, The Radical Cure of, Championniere, 354.
Herring, Rudolf, Disposal of Garbage and Refuse, 485.
Hinsdale, G., M. D., Treatment of Tuberculosis by the Anti-tubercle Serum, 25.
Hoffman, F. L., Life Insurance and Public Health Problems, 38; Mortality from Sunstroke and Heat Exhaustion, 328.
Hogan, Mrs. J. L., Household Economics, 481.

Holland, H., Surf Bathing and Swimming, 226.
Honesty and Cleanliness, Brooklyn Eagle, 496.
Horse Flesh, To Recognize, 353.
Hospitals in New York, 62.
Household Economics, Mrs. J. L. Hogan, 481.
How to Live One Hundred Years, Watkins, 232.
Hurty, J. N., Ph. D., Formaldehyd as a Milk Preservative, 317.
Hydrotherapeutics and Aerotherapeutics in the Prevention and Treatment of Pulmonary Tuberculosis, Knoff, 24.
Hydrozone for Disorders of the Genito-Urinary Tract, Aulde, 448.
Hygiene in Porto Rico, Triumph of, 373.
Hypnotic for Children, 356.
Hypnotism, Hamm, 286; In Tabes Dorsalis, Spalikowski, 154.
If They but Could, 187.
Index, 567.
Indian Children, Home Duties of, Fletcher, 94.
Ingalls, E. F., M. D., President's Address, Am. Clin. Assoc., 17.
Insane, The, Treatment of, in France, Beecher, 335.
Insanity, Feigned, and How It Worked, 344.
Inspection Better than Analysis, 63.
Iodin for Syphilis, Martin, 258.
Java, Crowded, 382.
Jew, the Adaptiveness of, 284.
Johnson, J. N., M. D., Disinfection with Phenols, 319.
Judd, L. D., M. D., Calomel in Diphtheria, 32.
Kansas State Board of Health, 458.
Karel, J., Government Liquor Monopoly in Russia, 246.
Kelvin, Lord, Electric Power and Light from City Refuse, 313.
Knight, F. I., M. D., Choice of Summer Residence, 19.
Knoff, Aerotherapeutics and Hydrotherapeutics in the Prevention of Tuberculosis, 24.
Leper, A, and the Health Service, 70.
Leprosy an Exclusively Human Disease, Prince A. Morrow, M. D., 561.
Leucocytes, Duchlaux, 91.
Life Insurance and Public Health Problems, Hoffman, 38.
Liquor Monopoly in Russia, Karel, 246.
London's Many Noises, 44.
Longevity, Some Conditions of, 148.
Louisville Quarantined and Why, 460.

Lunacy Hospitals, State Appointments of Attorneys for, 262.
Man and the Machine, Potter, 479.
Man of Him, Make a, Jordan, 429.
Man, The Lesser, 383.
Mausoleum System, The Sanitary, 158.
Mays, T. J., M. D., Salicylate Treatment of Hæmoptysis, 32.
McElroy, S., The Cause and Prevention of Water Fermentation, 141.
Medical Excerpt, Corbally, 53, 152, 255, 352, 444.
Medicine, Preventive, in New York, Biggs, 385.
Mexico, the City of, Health of, 82.
Michigan, Topography, Climate and Mineral Springs of, Bell, 113.
Milk, Preservative, Formaldehyd as a, Hurty, 317.
Milk, Pure, for Babies in Rochester, 262.
Milk, Sterilized, Value of, Strauss, 296.
Milk Supply of New York, 361.
Mineral Springs, Topography and Climate of Michigan, Bell, 113.
Mineral Springs, Topography and Climate of Minnesota, Bell, 321.
Mineral Springs, Topography and Climate of Wisconsin, Bell, 205.
Mineral Wool, 434.
Mine, The, Boylan, 348.
Minnesota, Topography, Climate and Mineral Springs of, Bell, 321.
Mivart, St. G., M. D., Diphtheria and Unsanitary Conditions, 412.
Modern Education, Prof. Mahaffy, 564.
Mobile, Sanitation for, 265.
Montizambert, Utility of Quarantine as Now Conducted in Canada, 414.
Mortality and Morbility Statistics and Reviews, 64, 160, 265, 362, 452, 551.
Mortality from Suicide, 175.
Mortality Statistics Abroad, 78, 278.
National Paradoxes, 254.
Nature—Study in Public Schools, 37.
Negro Mortality, 78.
Nephritis, Chronic, Crocq, 445; Pathology of, Senator, 446.
New Jersey, Disease Prevention in, 41.
Newton, Effects of Climate upon Men and Animals, 26.
New York, Department of Health, 250; Hospitals in, 62; Preventive Medicine in, Biggs, 385.
New York Schools, Medical Inspection of, 260.
Noises, Many, London's, 44.

"No Yellow Fever in Texas," 559.
OBITUARY:
Newton L. Bates, 474; William Du Bose Bratton, 475; William Henry Harrison Hutton, 178.
Oedema of the Lungs, Renault, 54.
Out of Town, 159.
Parr, Doctor, 351.
Partington, Mrs. on Education, 449.
Phillips, W. R., M. D., Metereological Conditions in Sunstroke, 32.
Phosphates, Tissue, Fenwick, 449.
Physicians and Their Armamentariuism, Tanner, 97.
Physiology of Mind, a, Attempts at, Scripture, 91.
Pierce, W. S., Sanitary Disposal of Garbage, 299.
Pitcher Plant, The, Kearney, 186.
Plague, The, 79; Nervous Lesions in, Nepveu, 353.
Pneumococcus, 153.
Pneumonia, Croupous, Vagaries of, Elsner, 29.
Pocket, The Wrong, 140.
Preservation of Grapes and Potatoes, Jones, 32.
Protomuclein as a Tissue Builder, 54.
Public Rights *vs.* Personal Liberty in Health Affairs, Fletcher, 166.
Publications Received, 565.
Pylosus, The, Resection of, Pean, 256.
Quarantine in Louisville, 460; in Tennessee, 470.
Quarantine Methods, Doty, 285.
Quarantine, Relation of Federal to State, Swearingen, 427.
Quarantine, Ship Island, A. C. Smith, 525; Bell, 530.
Quarantine Systems of the United States, Wyman, 418.
Quarantine, Utility of, in Canada, Montizambert, 414.
Rabies, Treatment of, 154.
Ransom, Treatment of Gout by Natural Mineral Waters, 30.
Refuse, City, Electric Power and Light from, Kelvin, 313.
Religions, Comparative, 286.
Salt Water for Street Sprinkling, 260.
Sanitarium, The Pennoyer, 207.
Sanitation for Mobile, 265.
Sanitation, Practical, The Bane of, 450.
Sanitation, Results of, 374.
Sanitation, Scarlet Fever and, Coxe, 137.
Sanitation, Village, Bashore, 315.
Scavengers, Unpaid, Holden, 478.

School Children, Play Ground for, 261.
School Children, The Seating of, 262.
Schools, New York, Medical Inspection of, 260.
Schools, Vacation, 285.
Science, A Brave Man of, 49.
Science, Modern, Advances of, Stead, 184.
Scrumpox, 64.
Sea, Lost at, Kobbe, 285.
Sexton, Watchful, 131.
Sing a Song, Fields, 236.
Sitting Down, 253.
Smallpox in Alabama, 265; the Promotion of, 61.
Smallpox and Yellow Fever in Cuba, 81.
Smith, A. C., Ship Island Quarantine, 525.
Smoke Nuisance, The, 467.
Soap, Castile, and the Plague, 155.
Soap, Pure, as a Lubricant in Practice, 155.
Spitting Reform, The, How it Began, 362.
Statistics, Vital of Buenos Ayres, 83.
St. Nicholas, 565.
Statistics, Vital, of Large Cities, 77.
Stimulus to Intellectual Work, 158.
Stink Plant, A Curious, 357.
Stomach, Perforation of the, 55.
Strauss, N., Value of Sterilized Milk, 296.
Street Sprinkling, Salt Water for, 260.
Structure and Function, Relation of, Prof. Trotter, 560.
Summer Residence, Choice of, Knight, 19.
Summer Resorts, 93.
Sunrise of the Poor, 185.
Sunstroke and Heat Exhaustion, Mortality from, Hoffman, 328.
Sunstroke, Meterological Conditions of, Phillips, 32.
Surf Bathing and Swimming, Holland, 226.
Swamp, The Dismal, 151.
Swearingen, Relation of Federal to State Quarantine, 427.
Sweating, Sage an Antidote to, Krahn, 256.
Swim, to, Anybody can Learn, 351.
Tabes Dorsalis, Hypnotism in, 154.
Tachycaidia, Clinical Study of, Curtain, 34.
Tanner, J. A., M. D., Physicians and Their Armamentarium, 97.

Taylor, Climate as a Factor in the Repair of Neurasthenia and Melancholia, 21.
Temperance Problem, The, Eliot, 237.
Temperance, Clothing and, 435.
Thermics and Thermo-Dynamics of the Body, Cordeiro, 3.
Topography, Climate and Mineral Springs of Michigan, Bell, 113.
Topography, Climate and Mineral Springs of Minnesota, Bell, 321.
Topography, Climate and Mineral Springs of Wisconsin, Bell, 205.
Transportation of Bodies Dead of Dangerous Communicable Diseases, 375.
Tsetse Fly Disease in Zululand, 51.
Tubercle, a, Extraction of, from the Conjunctiva, Valude, 355.
Tubercle Bacillus, Bryn, 280.
Tuberculin, Improved, Koch's, Corbally, 35.
Tuberculosis, Mataillon, 153.
Tuberculosis, Creosotal in the Treatment of, Dujardin-Beaumetz, 449.
Tuberculosis in Colorado, Bonny, 26.
Tuberculosis, Aerotherapeutics and Hydrotherapeutics in, Knoff, 24.
Tuberculosis, Pulmonary, Institution Treatment of, Ambler, 28.
Tuberculosis, The Bacillus of, Von Ruck, 22.
Tuberculosis, The Prevention of, Hamilton, 193.
Tuberculosis, Treatment of, Hinsdale, 25.
Tuberculosis Infection, Dangers of, Gardiner, 28.
Turpentine, Oil of, as a Remedial Agent, Walker, 29.
Typhoid Fever, Responsibility for, 63.
Typhoid Fever in Lowell, 71.
Uremia, Bleeding in the Treatment of, Laache, 447.
Van Voorhis, F. J., M. D., Health and Economics, 132.
Victoria the Good, Austin, 89.
Von Ihering, A., Trials of Gas Stoves, 438.
Von Ruck, K., M. D., Clinical Value of the Culture Products of the Bacillus of Tuberculosis, 22.
Walker, J. B., M. D., Oil of Turpentine as a Remedial Agent, 29.
Water Fermentation, The Cause and Prevention of, McElroy, 141.
Water, Malodorous, and Organisms, 156.
Water Pollution in Indiana, 268.
Water Supply of Asheville, N. C., 275.
Water Supply, The Farmer's, 168.
Waterways, Some Statistics of, 381.

Watkins, How to Live One Hundred Years, 232.
Weather, Hot, and Crime, 264.
Wisconsin, Topography, Climate and Mineral Springs of, Bell, 205.
Woman's Sphere, Elliott, 184.
World, The, as It is and Was, 283.
Wyman, Quarantine Systems of the United States, 418.
X Rays, Apostoli, 447; Applied to the Stomach, Roux, 355.
Yellow Fever, 359, 452, 545; Bacillus of, 360.
Yellow Fever and Smallpox in Cuba, 81.
Yellow Fever Outbreak, The, 359; in Atlanta, 455.
Yellow Fever, To Prevent the Introduction of, from Cuba, 176.

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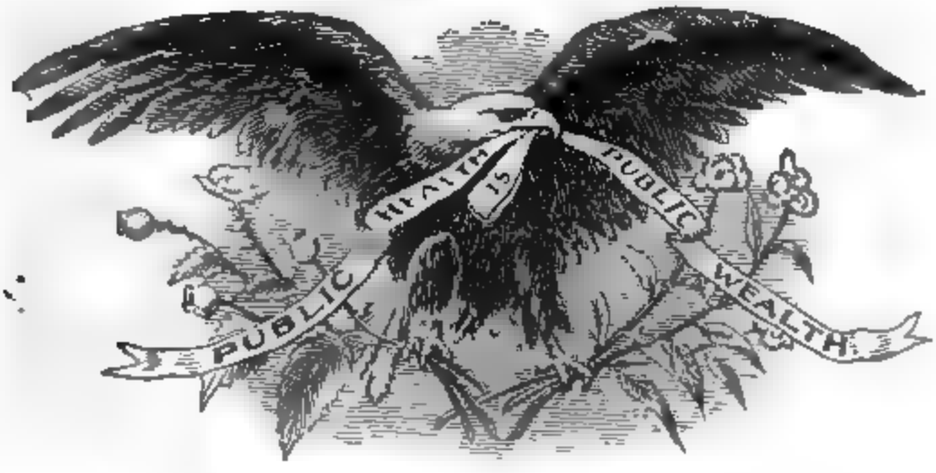

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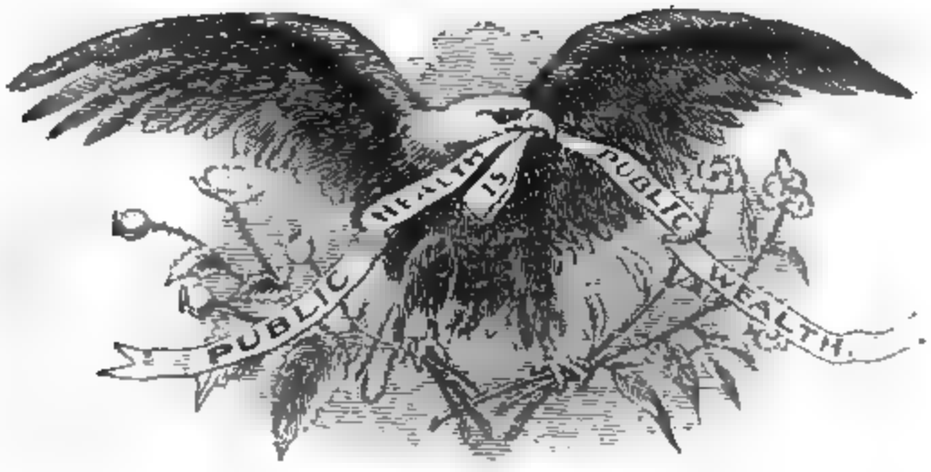

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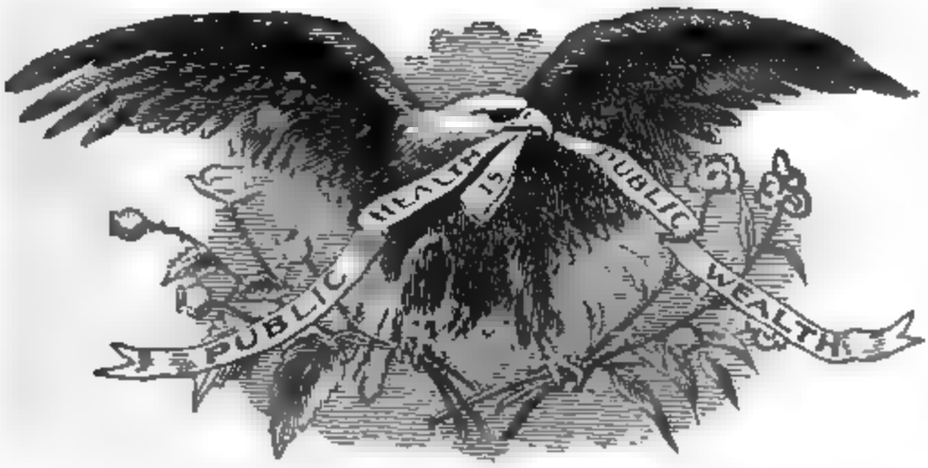

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CONTENTS.

HOUSEHOLD ECONOMICS.....*Mrs. John L. Hogan*.... 481
DISPOSAL OF GARBAGE AND REFUSE.....*Rudolph Herring*.... 485
HONESTY AND CLEANLINESS.....*The Brooklyn Eagle*.... 496
METHOD OF DISINFECTION WITH FORMALDEHYD GAS.....*Hans Arason*.... 498
DEPARTMENT OF PUBLIC HEALTH BILL.....*A. M. Association*.... 509
SHIP ISLAND QUARANTINE.....*A. C. Smith*.... 525
AMERICAN PUBLIC HEALTH ASSOCIATION PROCEEDINGS..... 531
OFFICERS ELECTED FOR THE ENSUING YEAR..... 540

(Continued on next page.)

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CONTENTS.

(*Continued from preceding page.*)

EDITOR'S TABLE:

YELLOW FEVER 545

DEPARTMENT OF PUBLIC HEALTH 547

MORTALITY AND MORBILITY—REPORTS AND REVIEWS 551

"NO YELLOW FEVER IN TEXAS" 559

CONTEMPORARY LITERATURE: THE RELATION OF STRUCTURE AND FUNCTION, FROM "BURS AND BEGGAR'S TICKS," PROF. TROTTER, *Appleton's Popular Science Monthly*; LEPROSY AN EXCLUSIVELY HUMAN DISEASE, FROM "LEPROSY AND HAWAIIAN ANNEXATION," DR. PRINCE A. MORROWS, *North American Review*; A GREAT AUTHORITY ON EVOLUTION, FROM "A GREAT NATURALIST," PROF. OSBORN, *Century*; DANGERS OF LUMBERING, FROM "THE STORY OF A PINE BOARD," W. S. HARWOOD, *St. Nicholas*; CHICAGO'S GREAT DITCH, "FROM THE LAKES TO THE SEA," CARL SNIDER, *American Monthly Review of Reviews*; "MODERN EDUCATION," PROF. MAHAFFY, *Nineteenth Century*; "CUBA," M. HANNIS TAYLOR, *North American Review; The Century; St. Nicholas* 560-564

PUBLICATIONS RECEIVED 565

INDEX TO VOLUME XXXIX 567

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BY M. E. CHARTIER,

Docteur en Medecine de la Faculte de Medecine de Paris, Membre Correspondant etranger de la Grande Encyclopedie, Section de Philologie.

As a rule certain diseases prove more fatal, not only in given districts, but during certain periods of time, along particular areas of territory. We have La Grippe, decreasing in intensity for the present; it has been replaced by pneumonia, which is not only raging in the United States, but in European countries. The bacteriologists will have to explain this fact; the truth remains however, that the mortality from pneumonia in its various forms is now far in excess of any previous record.

Twenty years ago, and preceding the re-appearance of La Grippe in its epidemic form, pneumonia proved as dangerous as it does at the present time. Many cases fell under my personal observation, and I must admit that my Parisian confreres were at a loss, not for a remedy for the disease alone, but even for a logical line of treatment. Dujardin-Beaumetz became so skeptical that he prescribed stimulants, regardless of therapeutical conditions. The mortality in his ward at the Hotel Dieu proved that his patients fared no worse than the others submitted to the antiphlogistic remedies then en vogue.

At that time, I advocated in my treatise on therapy, the administration of sulphate of codeine in two to five centigrammes doses—one-fourth to one-half grain. Codeine is the only remedy known to me possessing a marked and distinct effect upon the hypersecretions of the bronchial mucous membrane. What I then wished was an analgesic possessing antipyretic properties, which I could safely use. This I have since found in antikamnia and I believe it can be exhibited safely, especially on account of its not having a depressing effect on the cardiac system.

Experimental doses of from one-half to one gramme—seven to fifteen grains—of antikamnia administered under ordinary conditions did not develop any untoward after-effect. The following trace, taken with the sphygmograph was made ten minutes after the administration of one gramme—fifteen grains—of antikamnia.

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The above trace shows plainly that unlike other coal-tar products, antikamnia has a stimulating effect upon the circulation. In this particular case the temperature was sensibly reduced—102° to 101 1-5°. The analgesic effect of the drug was satisfactory.

My conclusion is that in the treatment of pneumonia, antikamnia is indicated as a necessary adjunct to codeine, on account of its analgesic and antipyretic properties and particularly because it acts as a tonic upon the nerve centres. The tablets of antikamnia and codeine containing four and three-quarter grains antikamnia and one-fourth grain sulphate of codeine, to my mind, present these two remedies in the most desirable form. I also find one tablet every hour, allowed to dissolve slowly in the mouth, almost a specific for the irritating cough so often met with in these complications. For general internal medication, it is always best to crush the tablets before administration.

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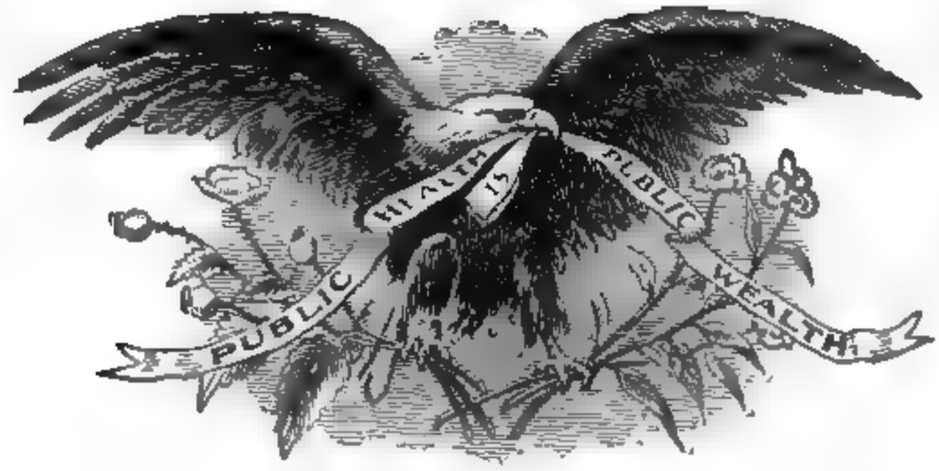

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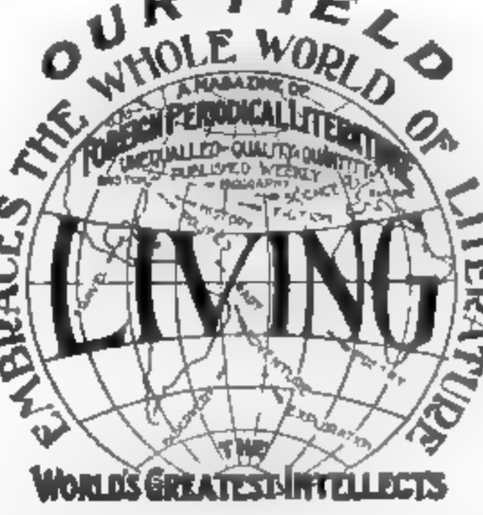

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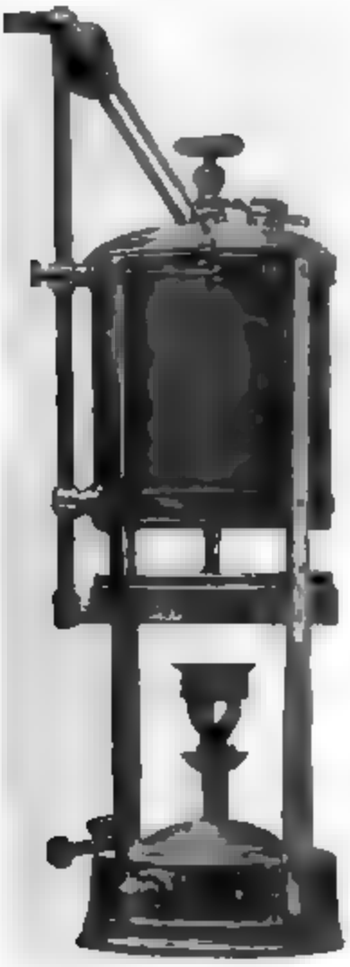

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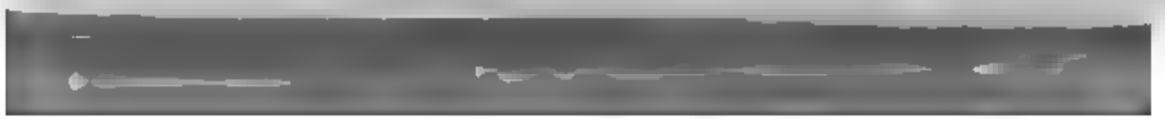

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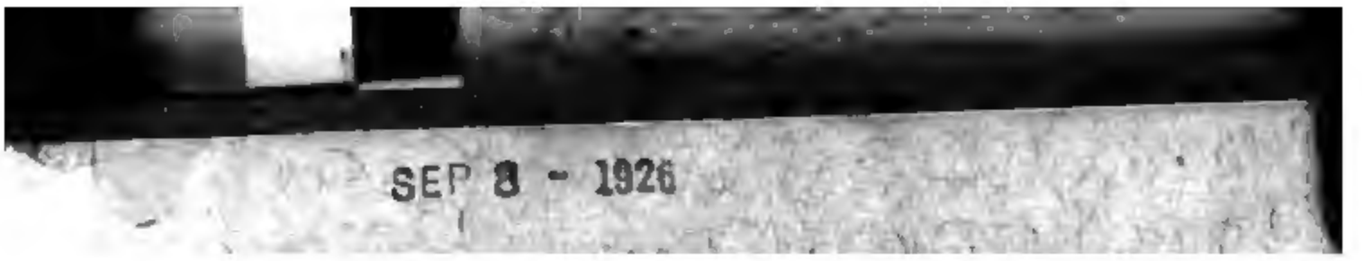
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